ATTACHMENT C

Metro

I-10 ExpressLanes/Busway

PILOT IMPLEMENTATION PLAN

A DEGRADATION MITIGATION STRATEGY

December 2019

Prepared by:

HNTB

INTENTIONALLY LEFT BLANK

Metro

Table of Contents

Executive Summary **1**

Introduction 1

Methodology and Findings 2

Pilot Implementation Plan Development 4

Pilot Implementation Plan ..... **Error! Bookmark not defined.**

Next Steps 7

1 I-10 HOV Degradation Mitigation **10**

1.1 Background 10

1.2 I-10 ExpressLanes Performance Degradation 10

1.2.1 Compliance with FHWA Requirements *10*

1.2.2 Performance Degradation Determination *12*

1.2.3 Degradation Mitigation Strategy Development *16*

1.2.4 Decision to Develop a Pilot Implementation Plan *18*

1.3 Potential Mobility Effects from Implementing the Pilot 18

1.4 Interpretation of Results 19

2 Pilot Implementation Plan Development **20**

2.1 PIP Development Process 20

2.2 Phased Approach to Increasing Occupancy Requirements 21

2.2.1 Phase 1: Transit Only (Buses and Registered Vanpools) *22*

2.2.2 Phase 2: Addition of HOV5+ and Mobile App *23*

2.2.3 Pilot Activities Timeline *24*

3 Pilot Implementation Schedule **26**

3.1 Pre-Pilot Activities 26

3.2 Phase 1 26

3.3 Phase 2 27

3.4 Transition to Permanent Operations 27

4 Peer Agencies' Lessons Learned and Best Practices **30**

4.1 Managed Lanes and HOV Overview 30

4.1.1 Key Concepts *30*

4.1.2 Overview of HOV Policies *32*

4.1.3 Evolution of HOV Policies *33*

4.2 Selection of Peer Agencies 35

4.2.1 Selection Criteria *35*

4.3 Interview Summaries 38

4.3.1 CDOT U.S. 36 and I-25 Express Lanes *38*

4.3.2 GDOT I-85 HOT Lanes *39*
4.3.3 VDOT's I-66 (Inside the Beltway) *41*
4.3.4 OCTA's 405 Express Lanes *42*
4.3.5 HCTRA's Katy Managed Lanes *43*
4.3.6 TxDOT's DFW Managed Lanes *45*
4.4 Findings/Recommendations 46
5 Partner Transit Agencies and Key Stakeholders 48
5.1 Partner Transit Agency Interview Summaries 48
5.1.1 Transit Agency Coordination and Implementation Plan *55*
5.2 Key Stakeholder Interview Summaries 56
5.2.1 Public Support *62*
5.2.2 Mitigation Strategies *62*
5.2.3 Key Stakeholder Coordination *63*
5.3 Findings/Recommendations 64
5.3.1 Partner Agency Findings/Recommendations *64*
5.3.2 Key Stakeholder Findings/Recommendations *65*
6 Preliminary Outreach 67
6.1 Focus Group Study 67
6.1.1 Methodology *67*
6.2 Corridor Survey 73
6.2.1 Key Findings *74*
6.3 Findings/Recommendations 75
7 Pilot Implementation Plan Support Strategies 77
7.1 Current Complementary Programs 77
7.1.1 Vanpool Program *77*
7.1.2 Transit Re-Investment Program *78*
7.2 Identification of Mitigation and Incentivization Strategies 78
7.3 Mitigation and Incentivization Strategy Evaluation 79
7.3.1 Mitigation and Incentivization Strategy Scoring *80*
7.4 Findings/Recommendations 81
8 Comprehensive Outreach and Education Plan 83
8.1 Outreach Plans and Principles 83
8.1.1 Vision 2028 Strategic Plan *83*
8.1.2 Public Participation Plan *84*
8.1.3 Equity Platform *84*
8.2 Outreach Strategy 84
8.2.1 Key Stakeholder Partnerships *85*

8.3 Marketing Plan 87
8.3.1 Media Buy Strategy 90
8.4 Findings/Recommendations 92
9 Operational Considerations 93
9.1 Existing Toll Signage 93
9.2 HOV Occupancy Signage Modifications 94
9.2.1 Proposed Sign Messaging 94
9.2.2 CA MUTCD and Caltrans Standard Plan 98
9.2.3 CA MUTCD Reference Standards and Basis of Design 98
9.3 Roles/Responsibilities and Implementation Schedule 99
9.4 HOV5+ Mobile Application 100
9.5 Findings/Recommendations 101
10 Data Collection and Analysis Plan 103
10.1 Performance Metrics 103
10.2 Findings/Recommendations 110
11 Cost Considerations 111
11.1 Methodology 111
11.2 Outreach, Education, and Marketing 111
11.3 Mitigation/Incentivization Strategies 112
11.4 Operational Elements 112
11.5 Before and After Data Analysis 112
12 Conclusion 113

Tables

Table 1. I-10 ExpressLanes Degradation Levels 12
Table 2. Degradation Frequency and Classification for I-10 ExpressLanes, January–June 2019 13
Table 3. Summary of Regional HOV/HOT Policies (by State) 32
Table 4. Types of HOV/HOT Policies 33
Table 5. Peer Agency Policy Changes and Key Recommendations 36
Table 6. Partner Agency Interview Summaries 53
Table 7. Key Stakeholder Interview Summaries 57
Table 8. Level of Coordination with Stakeholders 63
Table 9. Key Stakeholder List and Responsibility Matrix 64
Table 10. Preferred and Less Desirable Word Descriptors 69
Table 11. Preferred Media Channels by Group 69
Table 12. Summary of Benefits, Key Questions, Challenges, and General Comments 71
Table 13. Mitigation Strategies Suggested During the Focus Groups 72
Table 14. Incentives Suggested During the Focus Groups 73
Table 15. Mitigation/Incentivization Strategies and Complementary Programs 80
Table 16. Outreach and Community Relations Engagement Strategy 86
Table 17. Pilot Marketing Plan 87
Table 18. Pre-Pilot and Pilot Outreach Timelines 91
Table 19. Sign Modifications Summary 98
Table 20. Signage Updates - Roles and Responsibilities 99
Table 21. Signage Updates - Implementation Schedule (both phases) 100
Table 22. Data Collection Procedures for Metrics 104

Metro

Figures

Figure 1. Historical Context of the Facility 10
Figure 2. Westbound AM Peak Average Speeds from I-605 to Alameda Street 13
Figure 3. Eastbound PM Peak Average Speeds from Alameda Street to I-605 14
Figure 4. Speed Contour Chart for Eastbound I-10 ExpressLanes, January–June 2019 14
Figure 5. Speed Contour Chart for Westbound I-10 ExpressLanes, January–June 2019 15
Figure 6. Westbound AM Peak ExpressLanes Travel Times from I-605 to Alameda Street 15
Figure 7. Eastbound PM Peak ExpressLanes Travel Times from Alameda Street to I-605 16
Figure 8. I-10 Project Area Map 21
Figure 9. High-level PIP Implementation Schedule 28
Figure 10. Map of U.S. Priced Managed Lanes 31
Figure 11. Service Line Stops: El Monte Station to the El Monte Busway and Alameda Stop 48
Figure 12. Message Board Samples 68
Figure 13. Participants Opinion on Current Carpoolers Travel Preferences if Occupancy Increased 74
Figure 14. Top-ranked Mitigation Strategies to Maintain 2+/3+ Vehicle Pool 75
Figure 15. Top-ranked Incentives to Form a 5+ Vehicle Pool 75
Figure 16. HOV Occupancy Requirement Signs (Existing and Proposed for Phases 1 and 2) 94
Figure 17. Occupancy Requirement Signs (Phases 1 and 2) 95
Figure 18. Schematic Layout of Sign Placement 96
Figure 19. DMS with Modified Message and Static Sign Replacement (Existing and Proposed – Phase 1 and 2) 97
Figure 20. Cost Estimate Summary 111

Appendices

Appendix A. Proposed Signage Plan A-1
Appendix B. Implementation Roadmap and Master Schedule B-1
Appendix C. Risk Register C-1
Appendix D. Mitigation and Incentivization Strategy Methodology D-1
Appendix E. Caltrans 2016 California High Occupancy Vehicle Lane Degradation Determination Report E-1
Appendix F. Caltrans 2017 California High-Occupancy Vehicle Facilities Degradation Report and Action Plan F-1
Appendix G. Caltrans 2018 Managed Lanes Annual Report G-1

List of Acronyms/Abbreviations

ABBREVIATION	DEFINITION
ACTC	Alameda County Transportation Commission
App	Application
BOS	Back office System
Caltrans	California Department of Transportation
CAV	Clean Air Vehicle
CCRMA	Cameron County Regional Mobility Authority
CDOT	Colorado Department of Transportation
CHP	California Highway Patrol
CSC	Customer Service Center
CTRMA	Central Texas Regional Mobility Authority
CVC	California Vehicle Code
DFW	Dallas/Fort Worth
DMS	Dynamic Messaging Sign
EL	Express Lane
ETL	Express Toll Lanes
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FSP	Freeway Service Patrol
FTE	Florida's Turnpike Enterprise
FY	Fiscal Year
GDOT	Georgia Department of Transportation
GP	General Purpose
HCTRA	Harris County Toll Road Authority
HOT	High-occupancy Toll
Houston METRO	Metropolitan Transit Authority of Harris County
HOV	High-occupancy Vehicle
HOV2+	HOV with two or more people
HOV3+	HOV with three or more people
HOV5+	HOV with five or more people
HPTE	High-performance Transportation Enterprise

ABBREVIATION	DEFINITION
I-	Interstate
KPI	Key Performance Indicator
MDOT	Maryland Department of Transportation
Metro	Los Angeles County Metropolitan Transportation Authority
MnDOT	Minnesota Department of Transportation
Mph	miles per hour
MUTCD	Manual of Uniform Traffic Control Devices
NCTCOG	North Central Texas Council of Governments
OCTA	Orange County Transportation Authority
ODS	Overhead Detection System
P3	Public-Private Partnership
PeMS	Performance Measurement System
PIP	Pilot Implementation Plan
PR	Press Release
RCTC	Riverside County Transportation Commission
RTC	Regional Transportation Council
SANDAG	San Diego Association of Governments
SGV	San Gabriel Valley
SGVCOG	San Gabriel Valley Council of Governments
SOV	Single-occupancy Vehicle
SR	State Route
SRTA	State Road and Tollway Authority
TPO	Transition to Permanent Operations
TxDOT	Texas Department of Transportation
UDOT	Utah Department of Transportation
VDOT	Virginia Department of Transportation
VTA	Santa Clara Valley Transportation Authority
WSDOT	Washington Department of Transportation

Executive Summary

Introduction

Due to factors such as increased demand, capacity constraints west of the I-710 freeway, operational challenges approaching the I-10/I-605 interchange, and occupancy misdeclaration, degradation on the I-10 ExpressLanes has been increasing. A High Occupancy Vehicle (HOV) lane or ExpressLane is considered degraded if average traffic speeds during the morning or evening weekday peak commute period fall below 45 miles per hour for more than 10 percent of the time over a consecutive 180-day period. Currently, the facility requires three or more persons for toll free travel during the AM and PM peak periods (HOV 3+) and two or more persons for toll free travel (HOV 2+) at all other times.

In response, the Los Angeles County Metropolitan Transportation Authority's (Metro) Board of Directors (Board) put forth a motion in April 2018 that proposed developing a new operating approach on I-10 by increasing the occupancy requirements in the ExpressLanes. The Board motion included the following:

- Metro staff will work with Caltrans and other stakeholders to develop, within existing federal and state guidelines, a pilot exclusively for the I-10 ExpressLanes/Busway that would define carpools as registered vanpools with all other vehicles (other than passenger buses) subject to fees through a “Pay As You Go” model. The zero emission vehicles using the corridor would be eligible for discounts in effect at the time the pilot commences; and
- Metro staff will report back to the Metro Board within 180 days on potential effects, key decision points, and milestones necessary to implement the pilot, including community outreach with feedback and surveys and service analysis on impacts and exemptions for low-income commuters.

In January 2019, the Ad Hoc Congestion, Highway, and Roads Committee issued a motion in response to the April 2018 motion referenced above. This motion requested that Metro Staff report on:

1. Potential effects of implementing the Pilot;
2. Key decision points and milestones for implementation; and
3. Solicitation of feedback and evaluation of potential impacts associated with this Pilot with a focus on low-income commuters.

The Board adopted this motion authorizing the development of this Pilot Implementation Plan (PIP) to increase the I-10 ExpressLanes minimum occupancy requirement. Metro and Caltrans staff have also been coordinating with the Federal Highway Administration (FHWA) and FHWA has provided authorization to Caltrans and Metro to revise the definition of high-occupancy vehicles (HOV) in the I-10 ExpressLanes.

The PIP proposes a two phased approach to increasing occupancy on the I-10 – first to offer toll-free travel to transit vehicles only (defined as registered vanpools and transit) and then to vehicles with five or more occupants (HOV 5+). To accomplish this task, the PIP outlines the technical and operational requirements, communication and outreach plan, incentivization/mitigation strategies, budget, and schedule for planning and implementation.

Project Area

The project limits are identical to the existing Metro I-10 ExpressLanes between Alameda Street in the west and the I-605 freeway in the east.

I-10 ExpressLanes Project Area Map

Source: LA Metro ExpressLanes website (http://media.metro.net/projects_studies/expresslanes/images/ExpressLanes_Map_Toll_Entry.pdf)

Methodology and Findings

The PIP Development Process graphic below shows the sequence of activities that were used to develop the PIP. The activities were broken down into three phases – Research, Develop, and Implement. The Research phase focused on listening and gathering information to identify opportunities and potential concerns on the transit only and HOV5+ concepts and potential Pilot. The Develop phase includes preparation of mitigation/incentivization strategies, a comprehensive outreach/education plan, and operational considerations. The implement phase will take the plans prepared in the develop phase and put them into operation. All phases will require ongoing stakeholder collaboration/communication and program management coordination, progress reporting, and oversight. The following sections summarize the process, findings, and recommendations by phase and topic.

Research

Peer Agencies Interviews

Metro's research from speaking with peer toll agencies indicated that changing existing HOV occupancy policies is a challenging task when stricter policies are proposed. When comparing interview responses, numerous commonalities emerged as essential to a successful transition, including:

- Obtaining political support; it is key to successful implementation because elected officials and key communicators can help explain, answer questions, and communicate to the public which will help extend the reach of the outreach/marketing campaign.
- Conducting extensive public outreach; develop a robust public awareness/education campaign; and thoroughly educate the public on the new requirements prior to implementation.
- Implementing mitigation strategies to help make the transition to and implementation of new requirements as easy as possible, and offer incentives to ExpressLanes users to form vanpools/vehicle pools, increase transit usage, etc.
- Providing viable transit service options.

More from the interviews with peer agencies can be found in Section 4.

Partner Transit Agencies Interviews

Each partner transit agency interviewed brought a unique perspective regarding how the potential HOV5+ occupancy requirement may affect their service and operations. More detail on the interviews can be found in Section 5. Increasing speeds and decreasing travel times and operating costs were important benefits. However, if the HOV5+ requirement reduces congestion in the ExpressLanes, buses may travel faster than the GP lanes which may entice people to ride transit rather than drive. If the Pilot is implemented, it may have financial ramifications due to agencies needing to purchase more buses and hire additional operators and staff, if there is a significant increase in transit ridership.

Key Stakeholders Interviews

Most of the stakeholders from Caltrans and FHWA feel the ExpressLanes system is effective in reducing overall congestion and improving travel times on I-10. They acknowledged the ExpressLanes are more efficient than GP lanes, but they were concerned with the potential impacts to the GP lanes once this change in occupancy requirement goes into effect. They are concerned it will increase degradation and, in some cases, divert traffic onto local streets to avoid congestion on I-10. The ExpressLanes are susceptible to congestion due to enforcement challenges, especially during peak periods. Stakeholders suggested several potential mitigation strategies to address these concerns, which can be read in Section 5. Metro considered these suggestions and incorporated them into the PIP where feasible.

Preliminary Outreach

To inform development of the PIP and the related outreach and education plan, preliminary outreach activities, including focus groups and electronic/field surveying, were conducted. A detailed description of preliminary outreach activities and findings is included in Section 6.

Focus groups were held with voluntary community participants who commute as solo drivers, vehicle/van pools, or use transit on the I-10 corridor. In addition, Metro conducted field and electronic surveys and received approximately 2,400 survey responses. Focus group and survey findings and recommendations included:

- Existing carpoolers are more likely to seek out a 5+ vehicle pool.
- Financial incentives are the most attractive.
- Simple, straightforward, and transparent communication about the Pilot is desired.

- Communication through radio and newspaper ads, billboards, highway messaging signs, email, text, direct mail, and public outreach materials and events is preferred.
- More effective ExpressLanes enforcement is needed.

Based on these findings, a Comprehensive Outreach and Education Plan (Section 8) was developed. It includes a strategic messaging campaign to help build awareness and consensus and to consistently message the need and benefit of transit only and HOV5+ prior to implementation.

Develop

Based on what was learned in the investigation phase (RESEARCH), Metro considered several activities to include as components of the PIP during its development. These options were evaluated against the Pilot's goals and objectives while considering what would potentially be the most impactful and implemented in a short timeframe. That analysis resulted in the identification of specific activities that formed the PIP (DEVELOP). These are recommended for implementation as part of the PIP (IMPLEMENT).

Phased Approach

Increasing occupancy requirements aligns with the original intent of the El Monte Busway, and it will help mitigate degraded conditions caused by overutilization of the existing ExpressLanes, particularly where capacity is more constrained (e.g., I-10 ExpressLanes single-lane segments).

The Metro Board's April 2018 motion was to implement a Pilot that increases toll-free occupancy requirements from HOV2+/HOV3+ to transit (buses and vanpools only) to preserve the ExpressLanes as a fast, reliable travel option. After the motion was approved, Metro prepared the *I-10 ExpressLanes/Busway Preliminary Assessment* (October 2018), which provided an alternative option of allowing HOV5+ vehicles to travel toll free. As a result, the PIP proposes a two phased approach to increasing occupancy as follows:

- **Phase 1:** Transit only (buses and registered vanpools) travels toll free in the ExpressLanes; all others pay the full toll.
- **Phase 2:** Addition of HOV5+ vehicles travel toll free in the ExpressLanes; introduction of an occupancy declaration/verification mobile application (app).

Under the Pilot, Metro would revise the current definition of the HOV policy of HOV3+ (three-or-more-person vehicle pool) during peak and HOV2+ (two-person vehicle pool) during off-peak periods to transit only (buses and registered vanpools) in Phase 1 and then add HOV5+ (five-person vehicle pool) in Phase 2 for toll-free travel in the ExpressLanes.

In Phase 2, HOV5+ vehicles wishing to take advantage of toll-free travel will need a valid FasTrak® account and transponder or sticker tag on a vehicle's windshield, and they would have to declare a vehicle occupancy of at least five people using a mobile application (app).

PIP Support Strategies

The PIP also identifies potential mitigation and incentivization support strategies. Their purpose is to mitigate the Pilot's impacts on current HOV2+/3+ ExpressLanes users who will have to pay a toll under the Pilot and to encourage transit use and the formation of vanpools and 5+ vehicle pools. Certain existing Metro programs will also be featured as support strategies. The recommended mitigation and incentivization strategies are consistent with input received from focus groups and

field/online surveys conducted as part of the preliminary outreach efforts which informed development of the PIP.

Mitigation Strategies

The purpose of mitigation strategies is to offset the real or perceived impacts of changing the toll-free occupancy requirement from 2+/3+ to transit only and then HOV5+. The top mitigation strategies recommended for the Pilot include:

- Provide an introductory grace period of two months for 2+/3+ carpools (depending on peak period) where they can travel for free before the full implementation of each phase.
- Expand the existing 2+/3+ Carpool Loyalty Program.
- Expand the existing Transit Rewards Program.

Incentivization Strategies

Incentivization strategies are designed to encourage transit use and the formation and use of vanpools and 5+ vehicle pools beyond the financial incentive of toll-free travel. The top incentive strategies recommended for the Pilot are:

- Develop Vanpool and HOV5+ Vehicle Pool Loyalty Toll Credit Drawing Programs (similar to the current HOV2+/3+ program).
- Establish a Vehicle Pool Rewards program where the HOV5+ vehicle pool driver would receive a toll credit after 16 one-way trips during peak periods.

Existing and Potential Programs

The Pilot will benefit from the continuance of Metro's current Low-Income Assistance Plan and Guaranteed Ride Home Program. These programs will be continued, and ongoing outreach and education will be provided as part of the PIP. Metro will also continue current internal/external programs and relationships during the Pilot by collaborating with Metro Transit and other transit partners, 511, and third-party traffic information providers (e.g. Waze) or similar programs.

Additionally, an opportunity exists to further develop the concept of a Transit Re-Investment Program which would use excess toll revenues to enhance existing transit operations. This could encourage commuters to use transit over vehicles and increase passenger throughput, a goal of Metro's Congestion Reduction Program and this Pilot. As part of the Pilot's next steps, staff will collaborate with I-10 ExpressLanes transit operators (Metro and Foothill Transit) and continue to develop guidelines/criteria for participation in this potential program.

Disadvantaged Community and Equity Considerations

In all PIP and Pilot activities, Metro will focus on reaching and meeting the needs of disadvantaged communities and addressing equity concerns and opportunities. For the PIP, this primarily includes outreach activities and the continuance of the Low-Income Assistance Plan. Should the Pilot be successful and become permanent or extended to other Metro ExpressLanes facilities, there may be opportunities to further enhance these programs based on lessons learned during the Pilot.

Comprehensive Outreach and Education Campaign and Support Strategies Implementation

Section 8 discusses Metro's plan to implement a comprehensive public outreach/education campaign to support the Pilot. The program was developed based on input from focus groups,

surveys, stakeholders, and peer agencies and in close coordination with the Metro Marketing and Community Relations teams. The program's purpose is to 1) ensure I-10 corridor travelers are informed about the Pilot and the changes that will come with each phase; 2) mitigate impacts from the Pilot on current ExpressLanes users; and 3) encourage transit use and the formation of vanpools and HOV5+ vehicle pools as an alternative to driving alone or in smaller carpools. It will focus efforts on historically underserved and low-income populations and ensure all the appropriate audiences are reached.

Comprehensive outreach/education activities include:

- Communicating directly with Metro ExpressLanes FasTrak® customers.
- Engaging existing partnerships with key stakeholder groups within the San Gabriel Valley, sharing information with new stakeholders, and distributing collateral materials online, in-person, and by mail.
- Participating in targeted community events and meetings with community leaders in known I-10 commute sheds, with a focus on low-income and disadvantaged communities.
- Advertising on radio, digital display boards, and local newspapers, and Metro-owned media, including onboard rail/transit/bus advertising, 511, Metro and partner websites, and Metro Source articles.
- Leveraging Facebook, Instagram, and Twitter, which will act as tools to monitor and respond to public reactions to the Pilot.
- Utilizing free mediums available (social, digital, and press release [PR], editorial board, etc.) to maximize the number of impressions[1] and the budget.
- Conducting focus groups and electronic surveys to gather feedback.

Metro will also perform further education and outreach activities to support continuance of the Pilot or to revert to pre-Pilot operations depending on the Board's direction.

Operational Considerations

There are several operational considerations to be addressed for successful implementation of the Pilot. The Implementation Roadmap includes the following activities:

- Implement required signage changes to reflect the change to buses/registered vanpools only and then HOV5+ for toll-free travel in the I-10 ExpressLanes (Section 9 and Appendix A).
- Develop pre- and post-Pilot data needs and establish a baseline data and collection plan to assess impacts from each phase (Section 10).
- Procure and implement the mobile app for occupancy declaration prior to beginning Phase 2 (Section 9.4).
- Assess and implement needed modifications to BOS and customer service center (CSC) technology to support the Pilot.
- Train CHP enforcement officers, ExpressLanes customer service representatives, and other Metro staff for the Pilot.

[1] Impressions are the number of times an advertisement is viewed/heard by the public.

These activities will need to be completed before Go Live for Phases 1 and 2. Some of these activities are already underway. For example, Metro continues to meet with Caltrans and FHWA regarding signage changes and to identify data needs to evaluate the Phase 1 implementation. Also, preparations are underway for the mobile app procurement and to address potential customer service technology needs.

Implement

Program/Project Management

The PIP and the Pilot will be implemented and managed by Metro's Congestion Reduction Department. Program/ Project Management will be ongoing throughout the develop and implement phases. Specific program management tasks will include progress reporting, defining the decision-making structure, establishing a risk register/mitigation strategy (Appendix C), budget management, regularly reviewing the schedule and identifying critical path tasks, maintaining open issues lists, and conducting regular project team meetings.

Stakeholder Collaboration

Beginning shortly after Board approval and leading up to and during the Pilot, Metro will continue ongoing stakeholder collaboration with peer transit agencies, Caltrans, FHWA, CHP, and other stakeholders that provided input for the PIP, including KPIs to measure Pilot success. Collaboration activities will include meetings with stakeholders to review the PIP, establishing regular meetings leading up to and during the Pilot to share information, evaluating how the Pilot is progressing, and making course corrections as needed. PIP and Pilot Budget

As indicated below, the budget for the Pilot is expected to be around $7.9 million. A description of the cost estimate methodology is provided in Section 11.

TASK	COST
Outreach/Education/Marketing	$1,895,960
Mitigations/Incentives	$2,450,910
Operational Elements (i.e., design, signage changes, CSC/BOS, mobile app)	$2,109,575
Before/After Data Collection and Management	$1,452,300
TOTAL	**$7,908,745**

PIP Implementation Schedule

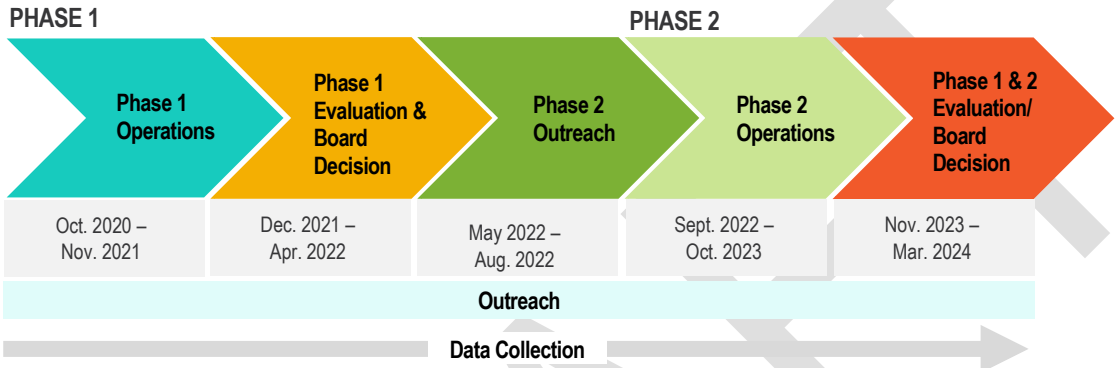
The PIP implementation schedule includes activities that need to be completed prior to Go Live, as well as activities that will be ongoing during the Pilot's phases and potentially occur post-Pilot. Metro anticipates that it will take approximately eight months to complete all the pre-Go Live activities for Phase 1. Metro anticipates a 14-month operational period for each phase that includes a two-month "grace period" to mitigate potential confusion by customers. The decision to implement Phase 2 will be dependent on the performance evaluation data from Phase 1 as well as the readiness of the mobile app. A high-level PIP implementation schedule is in Section 3 (Figure 11).

Proposed PIP activities are described in Sections 7 (Pilot Implementation Plan Support Strategies), 8 (Comprehensive Outreach and Education Plan), 9 (Operational Considerations, and 10 (Data Collection and Analysis Plan) of this document, and they are further expanded upon in the Implementation Roadmap and Master Schedule in Appendix B.

Next Steps

Metro is prepared to implement the PIP and will begin preparing for Phase 1 upon Board approval. The estimated Timeline of Pilot Implementation Activities is provided below:

Timeline of Pilot Activities



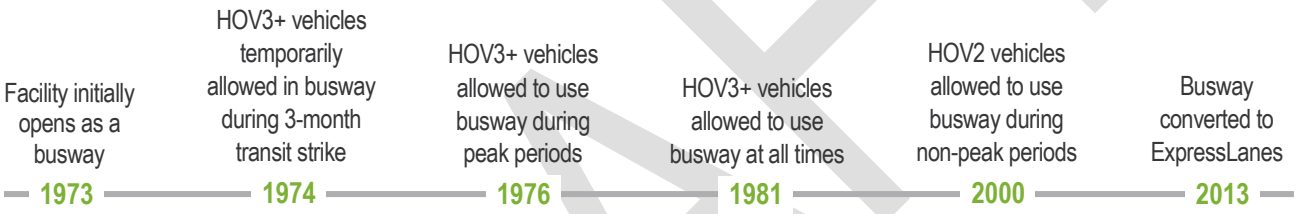
INTENTIONALLY LEFT BLANK

1 I-10 HOV Degradation Mitigation

1.1 Background

The Interstate 10 (I-10) High-occupancy Vehicle (HOV) lanes system began operation as the El Monte Busway in 1973, and it was opened to HOV3+ (three or more-person vehicle pool) traffic for a limited period during a bus strike in 1974. The busway was formally opened to HOV3+ in 1976 to further reduce congestion in the corridor. The ExpressLanes adopted existing occupancy requirements of HOV3+ during peak periods and HOV2+ (two or more-person vehicle pool) during the off-peak at the time of opening. In 2013, the Los Angeles County Metropolitan Transportation Authority's (Metro) ExpressLanes Program in Los Angeles County implemented conversion of the HOV lanes to High-occupancy Toll (HOT) lanes along I-10. HOT lanes allow buses, carpools, vanpools, motorcycles, and eligible clean air vehicles (CAV) to use the facility at no (or reduced) charge while single-occupancy vehicles (SOV) are afforded the option to travel the facility by paying a variable toll, thus avoiding traffic congestion that often occurs in the General Purpose (GP) lanes.

Figure 1. Historical Context of the Facility



Since its implementation in 2013, the ExpressLanes Pilot Program on I-10 and I-110 has yielded a number of operational and mobility benefits. It has provided congestion reduction benefits to SOVs while improving trip reliability for carpoolers and bus riders. Due to this success of the ExpressLanes Pilot Program, in September 2014 California State Senate Bill 1298 was signed into law granting Metro the authority to conduct, administer, and operate the I-10/I-110 ExpressLanes Program indefinitely. Although Metro currently operates the ExpressLanes, Caltrans continues to maintain the facilities.

Currently, HOVs must have a valid FasTrak® Flex switchable transponder and be HOV3+ during the AM (5:00am-9:00am) and PM (4:00pm-7:00pm) peak periods and HOV2+ all other times to use the ExpressLanes toll free. The I-10 ExpressLanes operate on a 24/7 schedule basis.

1.2 I-10 ExpressLanes Performance Degradation

1.2.1 Compliance with FHWA Requirements

Title 23 of the U.S. Code (Highways) Section 166(c) provides authority for public agencies to allow toll-paying vehicles that do not meet the minimum occupancy standards to use HOV/HOT lanes. Section 166 has several requirements that apply to HOT lanes, such as enforcing HOV restrictions, collecting tolls automatically (which must be varied to manage demand on the HOV facility), and ensuring the HOT lanes' operational performance does not become degraded.[2]

[2] https://www.fhwa.dot.gov/ipd/pdfs/fact_sheets/techtools_federal_highway_tolling.pdf

SECTION 166 HOV/HOT LANE PROGRAM

Under Section 166, existing HOV lanes may be converted to HOT lanes provided the local metropolitan planning organization endorses the use and cost of tolls on the converted lanes. All tolls on the new lanes must be variably priced and collected electronically to manage travel demand. To implement tolls on an existing HOV lane, project sponsors must demonstrate that the facility's conditions are not already degraded, and that the presence of toll-paying vehicles will not cause conditions to become degraded.

Ongoing annual reporting documenting conditions on the converted lanes is also required, and **if the HOV facility becomes degraded, the sponsor (in this case, Metro in partnership with Caltrans) must bring the facility into compliance by increasing HOV occupancy requirements, increasing tolls, increasing capacity, or eliminating access to paying motorists**.

Whenever an HOV lane is converted to HOT operations, the following certification provisions must be adhered to by:

- Certifying annually to FHWA that the operational requirements stipulated in Section 166 are being met, including vehicle eligibility, enforcement, and operational performance monitoring, evaluation, and reporting. The annual certification must demonstrate that the presence of toll-paying vehicles in the HOT lane has not caused degradation.
- Demonstrating that programs are in place to inform motorists how they may enroll and use the managed lane, either in a non-paying HOV vehicle or a paying HOT vehicle.
- Indicating that there is or will be an automated electronic toll collection system in place on the managed lane.[3]

Within the same regulations, there is a provision for addressing HOV facility degradation. It calls for the state agency with jurisdiction (in this case Caltrans) to submit a plan to FHWA that details the actions it will take to make significant progress towards bringing the facility into compliance with the minimum average operating speed performance standard.

Annually, Metro and Caltrans develop performance reports and plans that describe the current operations and strategies to improve or otherwise address degraded ExpressLanes or HOV facilities. Recent published documents include:

- *2016 California High Occupancy Vehicle Lane Degradation Determination Report* (Caltrans, Division of Traffic Operations-Office of Traffic Management, October 2017)*****
- *2016 California High Occupancy Vehicle Lane Degradation Action Plan* (Caltrans, Division of Traffic Operations-Office of Traffic Management, October 2017)
- *Metro ExpressLanes Operations Performance Report - Fiscal Year 2018* (Metro, June 2018)
- *2017 California High-Occupancy Vehicle Facilities Degradation Report and Action Plan* (Caltrans, November 2018)*
- *2018 Managed Lanes Annual Report* (Caltrans, April 2019)*

*****The report is included in the Appendices.

[3] https://www.fhwa.dot.gov/ipd/tolling_and_pricing/tolling_pricing/section_166.aspx

1.2.2 Performance Degradation Determination

According to FHWA, a HOV lane is considered degraded if the average traffic speed during the AM or PM weekday peak commute hours is less than 45 mph for more than 10% of the time over a consecutive 180-day period.

Despite the 2013 conversion of the I-10 HOV lanes to ExpressLanes, many segments of the I-10 ExpressLanes remain classified as degraded. I-10 vehicle volume has increased and the operational benefits of the ExpressLanes have been susceptible to congestion due to high occupancy misrepresentation. The ExpressLanes experience heavy congestion in the peak periods due to motorists claiming to be carpools while riding solo to avoid paying a toll. Consequently, the pricing algorithm cannot regulate the flow of the Express Lanes to maintain a minimum speed of 45 mph resulting in degradation of the facility, as confirmed by the Caltrans *2017 California High-Occupancy Vehicle Facilities Degradation Report and Action Plan* (November 2018). Caltrans defined degradation levels as:

1. *Not Degraded:* degradation occurs less than 10% of the time or two or less weekdays per month.
2. *Slightly Degraded:* degradation occurs 10-49% of the time or three to nine weekdays per month.
3. *Very Degraded:* degradation occurs from 50-74% of the time or 10-15 weekdays per month.
4. *Extremely Degraded:* degradation occurs 75% or more of the time or 16 or more weekdays per month.

Table 1 demonstrates the degradation levels along the I-10 ExpressLanes corridor.

Table 1. I-10 ExpressLanes Degradation Levels

SEGMENT DESCRIPTION	PERCENT OF DAYS WITH DEGRADATION						
	2013	2014	2015	2016	2017	2018^	2019^*
I-10 East: post miles 17.000 – 20.904	*(not reported by Caltrans)*					2.0%	9.2%
I-10 East: post miles 20.904 – 25.464	≥ 75%	≥ 75%	< 10%	< 10%	10–49%	0.4%	1.2%
I-10 East: post miles 25.464 – 31.200	≥ 75%	≥ 75%	≥ 75%	50–74%	≥ 75%	84.7%	76.6%
I-10 West: post miles 31.200 – 25.464	50–74%	50–74%	50–74%	10–49%	10–49%	68.6%	62.9%
I-10 West: post miles 25.464 – 20.904	50–74%	≥ 75%	50–74%	50–74%	50–74%	28.0%	29.4%
I-10 West: post miles 20.904 – 17.000	≥ 75%	≥ 75%	10–49%	10–49%	10–49%	10.2%	19.9%

Source: PeMS Data, Caltrans 2017 California High-Occupancy Vehicle Facilities Degradation Report and Action Plan (November 2018)

^ Degradation results for 2018 and 2019 are based on a detailed analysis of PeMS data and may differ from results reported in the 2018 Degradation Report due to differences in calculation methodology and analysis assumptions.

* Results for 2019 are for the period between January 1 and September 30.

The *2018 ExpressLanes Operations Performance Report* indicated that 41% of I-10 ExpressLanes users were HOV3+, but that data is based on self-declaration. However, when using the independent mode-split measurements conducted by Metro in 2018 and the most recent Caltrans *2018 Managed Lanes Annual Report,* mode split on the I-10 ExpressLanes during peak periods (as measured east of I-710) showed as:

- Single-occupancy vehicle (SOV): **65%**
- Carpools with two people: **20%**

- Carpools with three people: **4%**
- Carpools with more than three people" less than **1%**
- Clean air vehicles (may include above vehicle types as well): **6%**
- Buses: **4%**
- Vanpools: **2%**

2019 PERFORMANCE ANALYSIS

Supplemental analysis of 2019 speed data from Caltrans' Performance Measurement System (PeMS) provides further insight into the current operational state of the corridor with respect to degradation, travel times, and congestion patterns. Table 2 below summarizes the frequency and severity of performance degradation for the I-10 ExpressLanes for the 6-month period between January and June 2019. Results are based on detector data with a reliability score (i.e., percent observed) of at least 70%, and adopt the same conventions for "AM Peak" and "PM Peak" as Caltrans follows in its annual Degradation Report and Action Plan document.

Table 2. Degradation Frequency and Classification for I-10 ExpressLanes, January–June 2019

CORRIDOR AND TIME	PERCENT OF DAYS WITH DEGRADATION	DEGRADATION STATUS
I-10 West, AM Peak	44.9%	Slightly Degraded
I-10 East, AM Peak	0.0%	Not Degraded
I-10 West, PM Peak	0.0%	Not Degraded
I-10 East, PM Peak	42.6%	Slightly Degraded

Additional detail regarding the frequency and severity of degradation in the I-10 ExpressLanes is shown in Figure 2 through 5**Error! Reference source not found.**. These charts indicate the average end-to-end speeds during the AM and PM Peaks for each weekday between January and June 2019. Days where the average speed fell below the federal performance threshold of 45 mph are highlighted in yellow. Days where insufficient data were available due to detector reliability issues are shown as gaps.

Figure 2. Westbound AM Peak Average Speeds from I-605 to Alameda Street

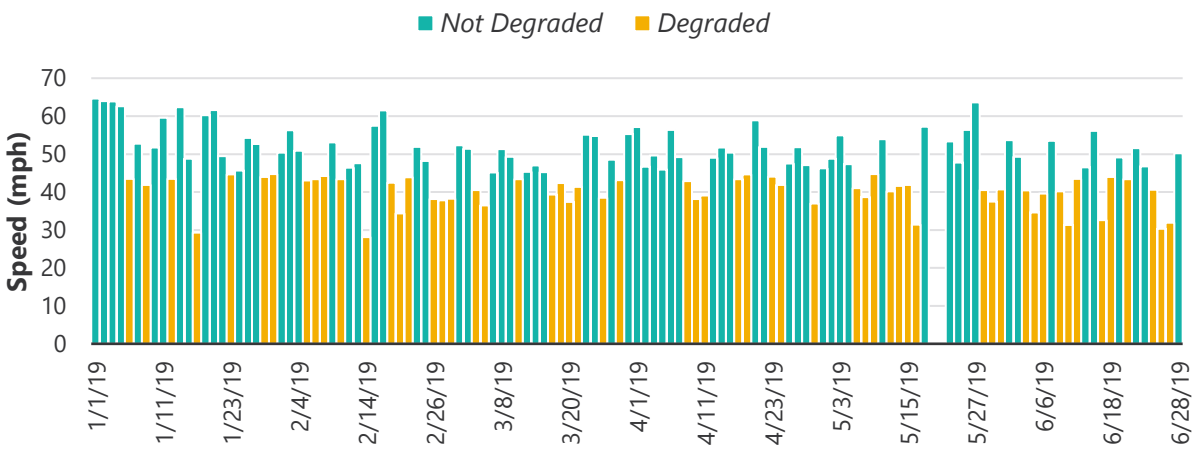
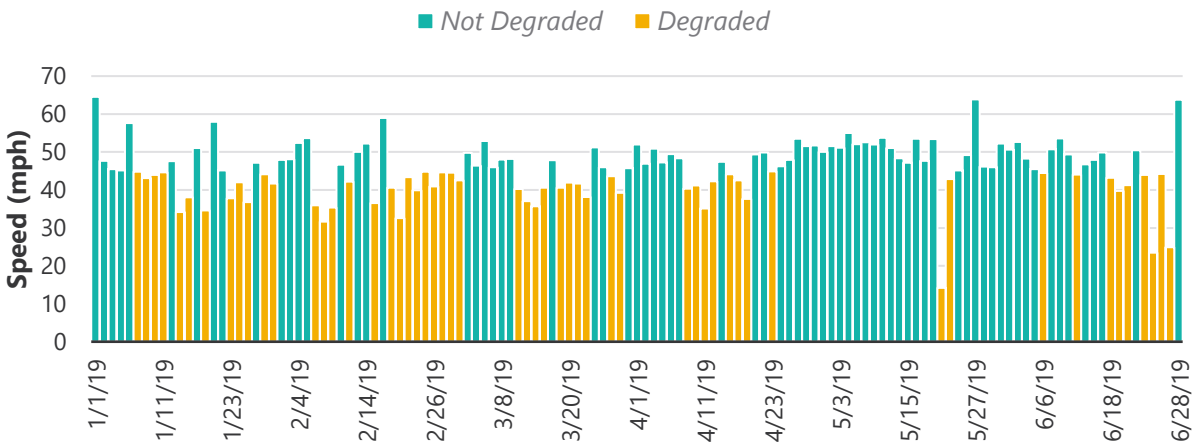


Figure 3. Eastbound PM Peak Average Speeds from Alameda Street to I-605



Further analysis of the Caltrans PeMS data reveals the regions on the corridor where congestion manifests throughout the day on a typical weekday. These results are visualized by the speed contour charts in Figure 4 and Figure 5. These figures convey the locations and times at which congestion commonly arises, with the color scale indicating the severity. These charts are based on 50th-percentile speeds, which are a reasonable characterization of average corridor congestion levels.

Figure 4. Speed Contour Chart for Eastbound I-10 ExpressLanes, January–June 2019

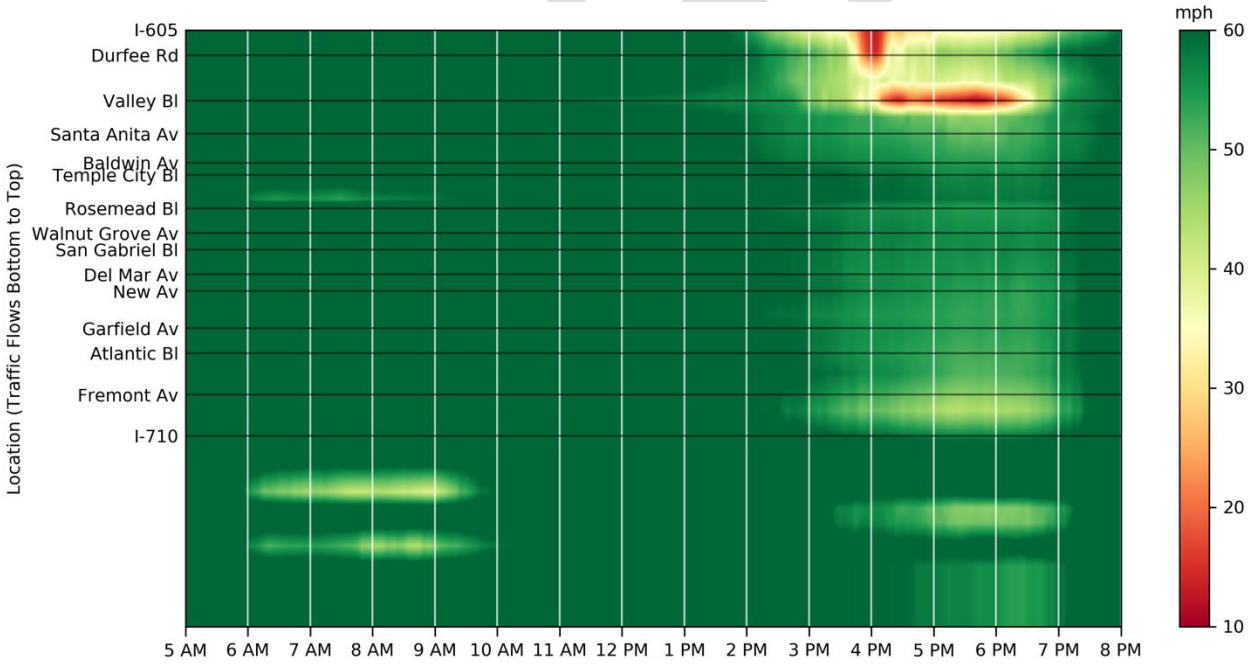
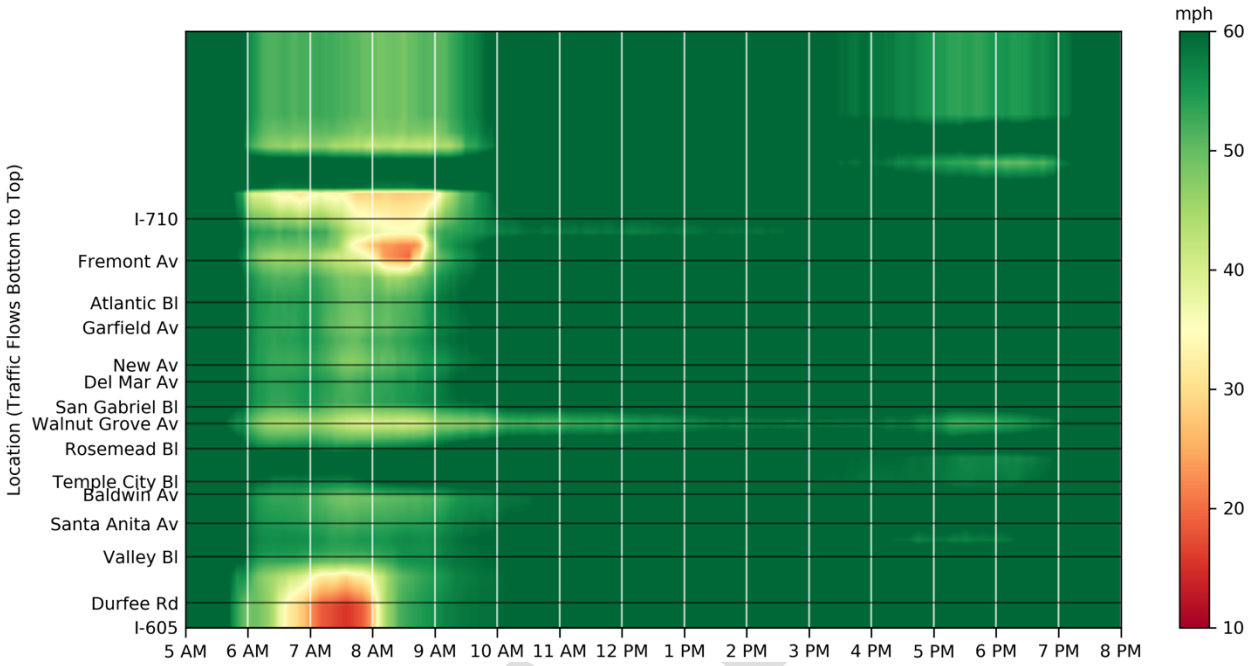


Figure 5. Speed Contour Chart for Westbound I-10 ExpressLanes, January–June 2019



Performance on the I-10 ExpressLanes corridor can also be characterized by the end-to-end travel time distributions. Travel times more precisely capture the quantitative impacts of congestion on individual drivers' mobility and are a metric that is more readily appreciated by the traveling public. Figure 6 and Figure 7 show the distributions for end-to-end corridor travel times throughout the day for each direction of the I-10 ExpressLanes. These figures not only show the typical or median (average) travel times, but also reveal the range or spread of travel times that a driver may encounter at any given time of day from one weekday to another. Wider shaded bands in Figure 6 and Figure 7 indicate more unpredictable or less reliable travel times on the corridor at those times.

Figure 6. Westbound AM Peak ExpressLanes Travel Times from I-605 to Alameda Street

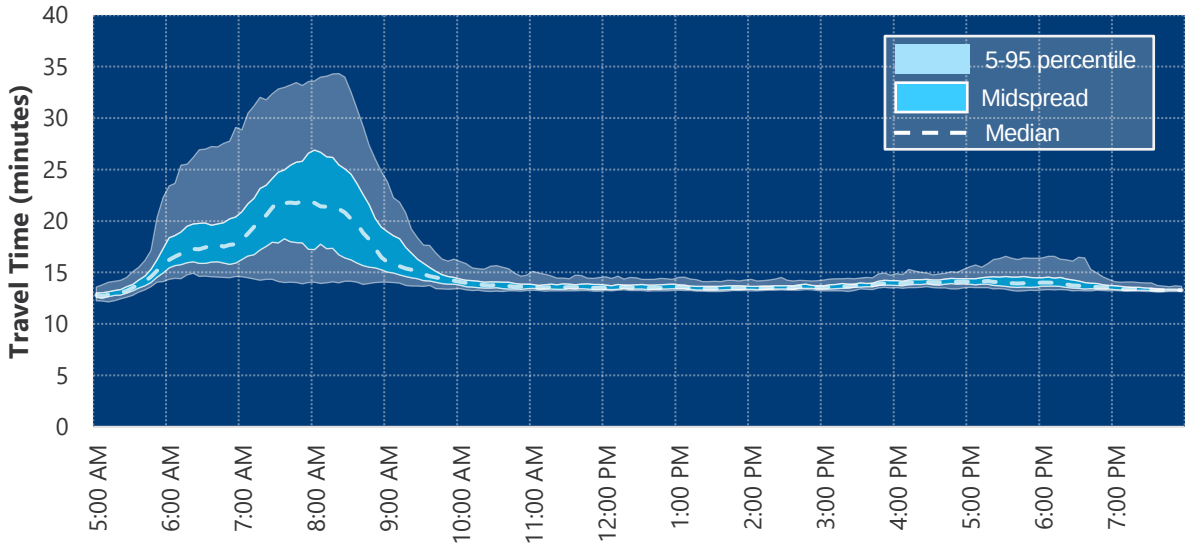
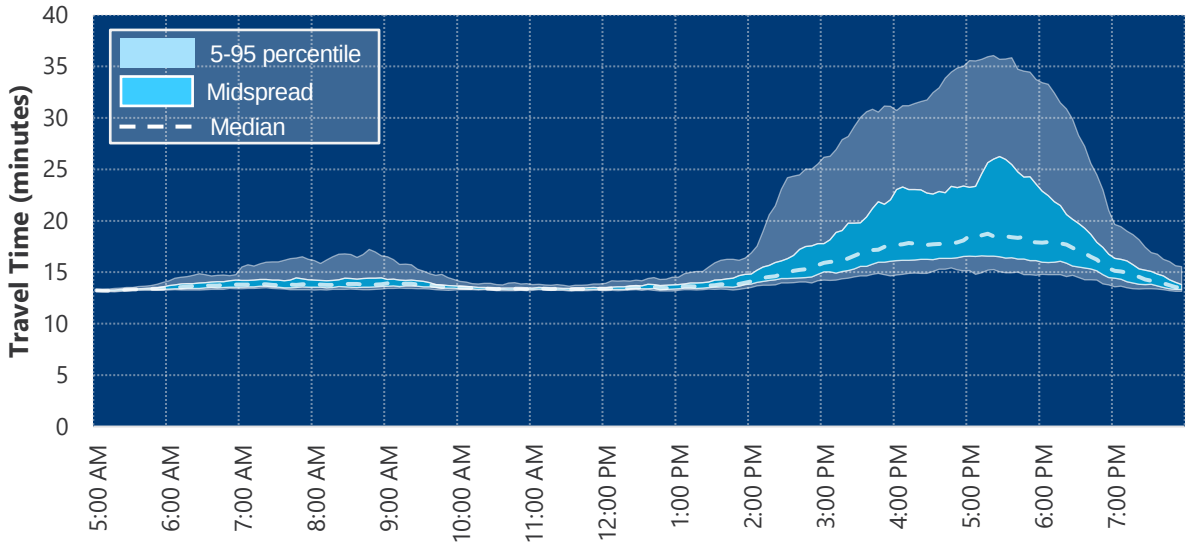


Figure 7. Eastbound PM Peak ExpressLanes Travel Times from Alameda Street to I-605



1.2.3 Degradation Mitigation Strategy Development

Metro and Caltrans have partnered to develop degradation mitigation strategies to address ExpressLanes degradation. In November 2018, FHWA sent a letter authorizing Caltrans and Metro's revisions to the HOV definition for the I-10 ExpressLanes. The Pilot Implementation Plan (PIP) could serve as a degradation mitigation demonstration project for Caltrans' development of an Action Plan to FHWA to improve performance and to achieve the average operating speeds defined in FHWA's Section 166 requirements. Collaboration regarding this topic and others has been ongoing throughout development of the PIP and will continue through implementation of the Pilot.

EFFORTS TO ADDRESS PERFORMANCE DEGRADATION

To help address performance degradation and restore compliance with Section 166, Metro and Caltrans have taken the following actions as they relate to the maintenance of operating performance.

Increase Enforcement

In California, enforcement of the ExpressLanes is regulated by the California Vehicle Code (CVC). Per CVC Section 23251, the California Highway Patrol (CHP) is responsible for policing all toll highways. Generally, CHP does not assign enforcement officers to monitor vehicle occupancies in the ExpressLanes. Instead, they focus their limited resources on safety issues and incident response.

In an effort to ensure comprehensive enforcement on the ExpressLanes, Metro has had an enforcement agreement with CHP since the inception of the ExpressLanes Program. Recently, the Metro Board of Directors (Board) approved a $9.71 million agreement with CHP for fiscal years (FY) 2019-2021 for dedicated officers to enforce ExpressLanes occupancy requirements and associated traffic laws. Metro also provides funding for a dedicated Freeway Service Patrol (FSP) to reduce traffic congestion in the ExpressLanes by removing disabled vehicles safely from the travel lanes. When requested, FSP will assist CHP in expediting accident and incident responses.

Recently, Metro started implementing an occupancy detection system on the ExpressLanes, which provides a technological approach to monitoring vehicle occupancy. However, there is a limitation to this system because it is unable to capture violators intent on evading tolling equipment/payment by obscuring their license plate. Also, illegal lane changes, such as crossing the double solid white

lines, are occurring to circumvent tolling equipment. Caltrans and Metro have been testing the efficacy of barriers, such as delineators, to minimize these illegal lane changes. Data collected by Metro shows citations are increasing monthly for license plate concealment/removal and illegal lane changes.

While current CHP enforcement and technological solutions under development can be used to discourage this behavior, both of these strategies have limitations. This Pilot is expected to mitigate this source of toll leakage and to enhance fairness/equity across all users by:

- Decreasing opportunities for occupancy misrepresentation, thereby preventing toll rates from being inflated by SOVs declaring as HOVs;
- Providing a greater ease of enforcement; and
- Diminishing dependency on occupancy detection systems over time.

Increase Tolls Thresholds

Metro applies dynamic pricing to the I-10 ExpressLanes with a cap on maximum tolls that is defined by the prevailing business rules. The toll rate schedule is a minimum of $0.10 per mile during off-peak hours and $0.35 per mile during peak hours. Currently, the maximum toll rate per mile for the ExpressLanes is $2.10. Metro has the authority to increase the maximum toll cap by $0.30 per mile annually based on HOV-only minutes. The maximum toll rate has been increasing consistently since 2016.

Expand Capacity

A majority of the freeway right-of-way containing the I-10 ExpressLanes is highly constrained. The segment between downtown Los Angeles and just east of I-710 carries one lane in each direction. It is barrier separated from the GP lanes and runs along an existing railroad right-of-way adjacent to the I-10. The ExpressLanes are situated between the I-10 GP lanes and the railroad right-of-way making any widening infeasible. A second express lane was added in each direction in the segment between east of I-710 and I-605 when the HOV lanes were converted to ExpressLanes.

Prior to the construction of the ExpressLanes, this section of I-10 consisted of one standard width (12 feet) HOV lane, two/three standard width GP lanes, and one non-standard (11 feet) GP lane. To accommodate the second express lane, the existing HOV lane and all GP lanes were reduced to non-standard widths except for auxiliary lanes and the outermost GP lane. To incorporate standard width express lanes and shoulders, the project footprint would have required an additional eight-feet triggering considerable right-of-way acquisition and environmental impacts.

With the addition of the second express lane between I-710 and I-605 through non-standard lane and shoulder widths, traffic flow capacity on the I-10 within the existing right-of-way has been maximized. Any additional widening would require reconstruction and/or reconfiguration of the on/off-ramps, frontage roads, structures, pedestrian overcrossings, and sound walls. The environmental impacts and right-of-way acquisition could cost nearly $1 billion and would likely face significant opposition from the community, cities, stakeholders, and elected officials.

Manage Non-HOV Usage

Currently, HOVs and SOVs with registered FasTrak® transponders may use the ExpressLanes. According to Metro's *FY 2018 ExpressLanes Performance Report*, SOVs make up about 44% of ExpressLanes users. Currently, Metro and Caltrans do not intend to change the policy and discontinue non-HOV use. The PIP proposes to charge all vehicles, except for HOV5+ vehicle pools and passenger buses.

Prior to 2019, CAVs were allowed to use the ExpressLanes toll free regardless of occupancy. The California legislature recently acknowledged that CAVs may be a contributing factor to traffic congestion in the HOT lanes. It authorized HOT lane operators to charge CAVs with partial tolls for more effective traffic demand management. In April 2018, the Board approved charging CAVs tolls (15% discount from SOV toll rates) beginning in March 2019.

Metro does not expect the Pilot to adversely impact the GP lanes. Currently, studies are being conducted and will continue throughout the Pilot and post-Pilot regarding performance requirements such as operating speeds and person throughput.

Raise Vehicle Occupancy Requirements

In FY 2018, there were over 15.9 million trips on the I-10 ExpressLanes — a 4.7% increase over the previous year and a 58% increase since 2014. Concurrently, morning commute speeds have decreased by 12.5% between 2013 and 2018. When traffic density increases to the point that speeds fall below 45 mph, the system goes into "HOV-only" mode and only HOVs are allowed to enter the ExpressLanes. HOV-only time increased by 250% between 2014 and 2017, before falling by 14% in 2018. This trend is likely to continue with increasing congestion coupled with the current occupancy requirements (HOV2+/3+), vehicle exemptions, and related violations.

1.2.4 Decision to Develop a Pilot Implementation Plan

Literature review as well as preliminary outreach provides strong indication that the ExpressLanes system is effective in reducing overall congestion and improving travel times on the I-10. In response to the facility experiencing performance degradation, FHWA provided authorization to Caltrans and Metro to revise the definition of HOV on the corridor. The Board adopted a motion in January 2019 that authorized the development of a PIP to increase the minimum occupancy on the I-10 ExpressLanes. The PIP serves as a way to address degraded traffic conditions from increased demand on the lanes resulting from growing usage and increased misrepresentation. Under the Pilot, Metro would replace the current HOV policy of HOV3+ during peak and HOV2+ during off-peak periods with HOV5+ (five or more-person vehicle pool) at all times for toll-free travel on the I-10 ExpressLanes. The implementation of the I-10 HOV5+ Pilot Program could serve as an Action Plan to address degradation on the I-10 ExpressLanes.

1.3 Potential Mobility Effects from Implementing the Pilot

The potential mobility effects of the Pilot were evaluated by using an integrated combination of simulation analysis, travel demand modeling, and dynamic toll modeling. At this early stage, these should be interpreted as sketch-planning level results only. This operational impact analysis considered the AM and PM weekday peak periods.

ExpressLanes

- Increase in ExpressLanes person-throughput by 600 persons/day (**4% increase** for ExpressLanes throughput).
- Changes in average end-to-end travel times:
  - Increase in westbound AM peak by 0.3 minutes.
  - Decrease in westbound PM peak by 0.1 minutes.
  - No change to eastbound AM peak.

  - Increase in eastbound PM peak by 1.8 minutes due to queueing at the east end where the ExpressLanes merge back into the GP lanes.

- Increase in average delay cost to ExpressLanes users of $0.18 per person/trip due to queueing at the end of the ExpressLanes where they merge back into the GP lanes.

Transit impacts were found to be negligible with respect to average travel time performance. Because simulation models are not designed to directly capture reliability impacts, these could not be evaluated.

General Purpose Lanes

- Overall increase in average end-to-end travel times by four minutes. Currently corridor-wide travel times rise above their average levels by as much as 26 minutes day-to-day during peak periods due to random variations in traffic. When focusing specifically on the PM peak eastbound direction, the average projected travel time increase is 21 minutes.

Corridor-wide

- Overall mobility benefit would be about **$3.7 million** per day in time/delay cost savings.
- Provision of a long-term, sustainable toll strategy that is less susceptible to congestion — especially congestion caused by misrepresentation of occupancy.

1.4 Interpretation of Results

The Pilot could achieve the stated goals of reducing ExpressLanes travel times for transit, and it is anticipated to increase person throughput. The new proposed toll policy affords other tangible mobility benefits that, while outside the scope of this analysis, are important to note qualitatively:

- Substantial improvements to travel time reliability in the ExpressLanes may occur from modifying the criteria for toll-exempt travel because it would allow the system to manage congestion more effectively. Travel time reliability is a measure of the predictability and consistency of travel times and as travel time reliability improves, travelers will benefit by being able to reach their destinations faster.
- Quicker response times for emergency and FSP vehicles could result in clearing incidents faster and reducing delay times.
- Opportunities for occupancy misrepresentation may be minimized.

2 Pilot Implementation Plan Development

As a first step in addressing degradation in the I-10 ExpressLanes, Metro has developed a Pilot Implementation Plan (PIP). The following sections describe the PIP's development.

2.1 PIP Development Process

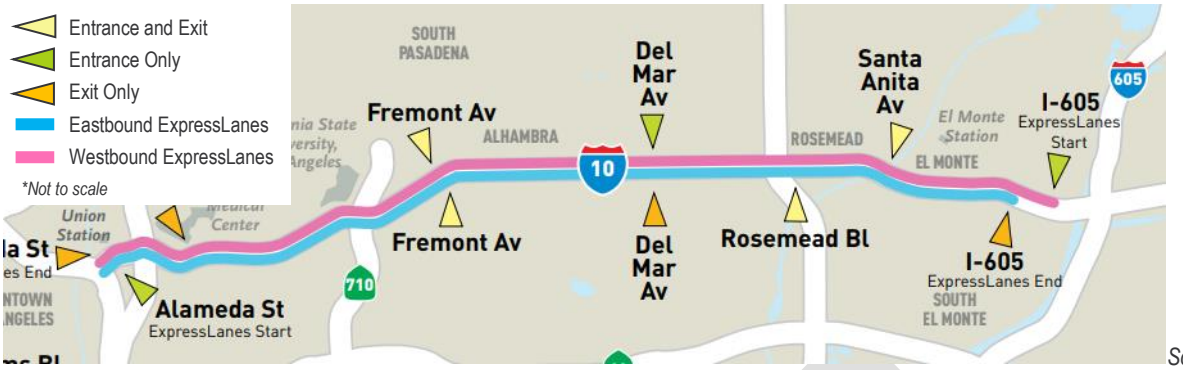
Metro prepared the PIP based on eight topics that were researched and analyzed, which resulted in the information provided in the PIP. The information is summarized by activity:

- Peer Agencies' Lessons Learned and Best Practices Research
- Partner Transit Agencies and Key Stakeholders Interviews
- Preliminary Outreach
- PIP Support Strategies
- Comprehensive Outreach and Education Plan
- Required Signage Modifications
- Data Collection and Analysis Plan
- Cost Considerations

The PIP Development Process graphic shows Metro's progression through the aforementioned activities to develop the PIP. It begins with Metro Board approval and ends with the major milestone of the Pilot going live (Go Live). Although the timeline ends with Go Live, it is important to note that Metro will conduct an evaluation at the end of the Pilot.

Figure 10 depicts the project area. The project limits are contiguous with the existing Metro I-10 ExpressLanes. Other than the increased vehicle occupancy requirement and occupancy declaration process, the Pilot would make no changes to the configuration or operations of the I-10 ExpressLanes.

Figure 8. I-10 Project Area Map



Source: LA Metro ExpressLanes website (http://media.metro.net/projects_studies/expresslanes/images/ExpressLanes_Map_Toll_Entry.pdf)

The information in the subsequent sections summarizes the process, findings, and recommendations from these activities. The PIP includes appendices, which include the detailed implementation cost estimate, preliminary risk register, implementation roadmap/master schedule, and the methodology applied to the mitigation and incentivization strategies.

Also, the PIP discusses the required changes necessary for ExpressLanes facility operations to accommodate the Pilot (e.g. back-office system [BOS], roadside, and signage changes); public education and outreach program; and mitigation and incentive strategies to address concerns and encourage vanpool participation, transit use, and 5+ vehicle pool formation.

2.2 Phased Approach to Increasing Occupancy Requirements

Increasing occupancy requirements aligns with the original intent of the El Monte Busway which was conceived as a way to move commuters out of their personal vehicles and onto mass transit while still using the same freeway infrastructure. It will help mitigate the overutilization of the existing ExpressLanes, particularly where capacity is more constrained (e.g., I-10 ExpressLanes single-lane segments).

The Metro Board's April 2018 motion was to implement a Pilot that increases toll-free occupancy requirements from HOV2+/HOV3+ to transit (buses and vanpools only) to preserve the ExpressLanes as a fast, reliable travel option for transit users and all corridor travelers. After the motion was approved, Metro prepared the *I-10 ExpressLanes/Busway Preliminary Assessment* (October 2018), which provided an alternative of HOV5+ travel toll free. Metro carefully considered both options and is instituting a two-phase approach that combines the original intent of transit only and the HOV5+ alternative:

- **Phase 1:** Transit only (buses and registered vanpools) travels toll free in the ExpressLanes; all others pay the full toll.
- **Phase 2:** Addition of HOV5+ travel toll free in the ExpressLanes; introduction of an occupancy declaration/verification mobile application (app).

Development of the phased approach and PIP support strategies were informed by Metro's preliminary outreach and interviews with partner agencies and stakeholders. Also, focus groups expressed concerns about the challenge of forming 5+ vehicle pools. Implementing a phased approach will allow Metro to focus on reaching and educating the public far in advance of Phase 2, and it will allow the public to acclimate to the new, higher occupancy policies. By starting Phase 2 outreach during Phase 1, it will make it easier to communicate and implement Phase 2 because

HOV5+ will not be an abrupt change. This phased approach allows for a more comprehensive outreach/education program throughout the Pilot, and it provides the time needed to develop and test the mobile app.

A phased approach provides Metro with the opportunity to evaluate Phase 1's effects on capacity to determine if it is accomplishing the PIP's goals. By conducting an evaluation prior to Phase 2, it allows Metro to determine if the ExpressLanes are maximizing throughput and do not require Phase 2 implementation or if they have excess capacity that may be alleviated by Phase 2 implementation.

Also, by implementing Phase 1 first, Metro will have the necessary time to work through processes and testing, so the mobile app has the intended impact in Phase 2. This will help mitigate the risks that accompany new technology development, such as privacy and safety concerns.

2.2.1 Phase 1: Transit Only (Buses and Registered Vanpools)

Phase 1 is anticipated to have a 14-month operational period (including a 2-month introductory grace period), and a 5-month evaluation period (before and after performance analyses).

Phase 1's business rules are: transit and registered vanpools travel toll-free at all times; all others pay the full toll. All current clean air vehicle (CAV), carpool incentives, and transit and other programs remain in place.

Phase 1 Benefits:

- Promotes transit use and encourages vanpooling.
- Encourages carpooling to share tolls.
- Decreases opportunities for occupancy misrepresentation.
- Mitigates overutilization of the ExpressLanes.
- Moves transit more efficiently through the corridor/has the most near-term potential to improve transit time reliability.
- No change to low-income/equity programs.
- Expands Transit Rewards and Carpool Loyalty programs.
- Allows Metro to address ExpressLanes degradation while the occupancy declaration/verification mobile app is under development.
- Minimizes risk to Phase 2's schedule due to mobile app development/deployment delays.
- Gives Metro time to build upon outreach and education plans and target groups that will be impacted most by Phase 2.

EXISTING AND PLANNED COMPLIANCE STRATEGIES

Several strategies are already in place or in the process of being implemented to address sources of toll evasion that contribute to unmanaged volume and resultant degradation in the ExpressLanes. Several of the more significant compliance strategies are described below.

Dedicated CHP Enforcement

To provide comprehensive enforcement on the ExpressLanes, Metro has had an enforcement agreement with CHP since the inception of the ExpressLanes Program. Recently, Metro entered into an agreement with CHP for FY 2019-2021 for dedicated enforcement of the ExpressLanes

occupancy requirements and associated traffic laws. In FY 2018, the ExpressLanes had a total of 40,646,830 trips of which CHP issued 7,347 citations.

Enforcement Beacons

To aid CHP's enforcement of toll-free occupancy requirements, there are enforcement beacons installed at each ExpressLanes gantry, that use an array of lights to indicate the occupancy level declared by each vehicle as it passes through the toll zone. In coordination with CHP, Metro ExpressLanes staff have recently ordered upgraded enforcement beacons that use full matrix display panels showing large digits that represent the declared occupancy. These new displays will allow CHP to more readily identify vehicles that are claiming to be HOV for more effective compliance monitoring.

Occupancy Detection System

As part of the effort to identify and deter violations in the ExpressLanes, Metro is implementing an Occupancy Detection System (ODS) proof of concept. This system uses a set of strategically positioned cameras and illuminators to capture images of vehicles traveling in the ExpressLanes, which are then automatically reviewed by an image processor to evaluate and verify the number of occupants. This enables the independent verification of vehicles claiming to be HOV prior to granting toll-free travel. ODS is one strategy for reducing occupancy misrepresentation in the ExpressLanes; however, it works only when the system has a clear view into the full passenger compartment of the vehicle. Also, it is cost prohibitive to install at all toll collection gantries across the corridors.

Channelizers

Channelizers are a type of flexible barrier used to supplement pavement markings and convey prohibited maneuvers to drivers. Metro installed channelizers on both corridors to discourage illegal and unsafe maneuvers when entering/exiting the ExpressLanes. Many are located near gantries to help combat toll evasion.

2.2.2 Phase 2: Addition of HOV5+ and Mobile App

At this time, it is anticipated that there will be excess capacity after Phase 1. Phase 2 is anticipated to have a 4-month outreach period (would occur concurrently with Phase 1), a 14-month operational period (includes a 2-month introductory grace period and ongoing program evaluation). Once Phase 1 is implemented, it will undergo ongoing performance evaluations to determine if it is accomplishing the PIP's goals of addressing transit travel time reliability, misrepresentation, and enforcement challenges, and if there is excess capacity in the ExpressLanes. These evaluations will inform the need for Phase 2 implementation, which will be dependent on the development and testing of the mobile app.

Phase 2's business rules are: transit, registered vanpools, and HOV5+ travel toll free at all times; all others pay the full toll. ExpressLanes users wishing to take advantage of toll-free travel would be required to adhere to current requirements and have a valid FasTrak® account and transponder or sticker tag mounted on the vehicle windshield, and they would have to declare a minimum vehicle occupancy of five people using a mobile app. All current clean air vehicle (CAV), carpool incentives, and transit and other programs remain in place.

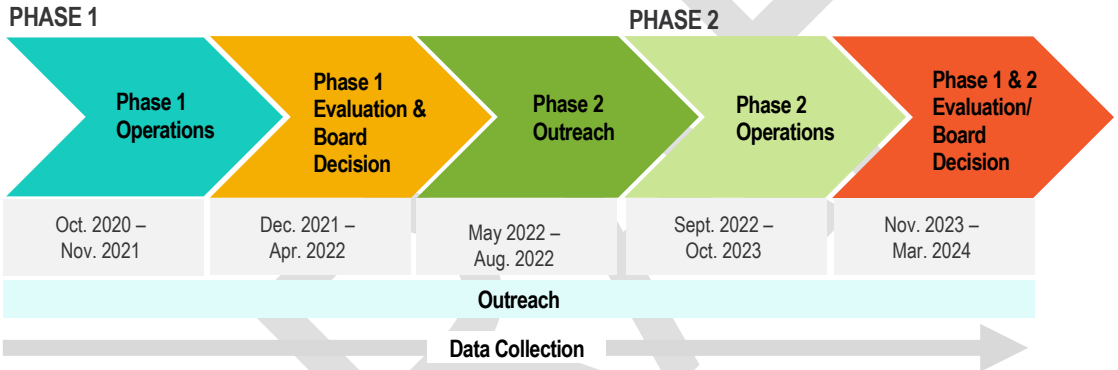
Phase 2 Benefits:

- Same as Phase 1 plus:
  - Maximizes corridor throughput.
  - Allows more inclusive vehicle pool formation/participation options.
  - Improves enforcement strategies.
  - Integrates a mobile app to declare and verify vehicle occupancy.
  - Decreases occupancy misrepresentation further.

2.2.3 Pilot Activities Timeline

Below is a timeline of the Pilot activities beginning with Phase 1 operations and ending with receiving the Board's decision to either transition to permanent operations (TPO) or revert back to pre-Pilot operations. It is anticipated the Pilot, inclusive of all activities, will last approximately 3.5 years. The anticipated dates (month, year) for each period and the months they would occur in are shown below each activity name.

Timeline of Pilot Activities



INTENTIONALLY LEFT BLANK

3 Pilot Implementation Schedule

Metro recommends two phases for the I-10 Pilot, with each phase containing a 12-month full deployment period, a two-month initial grace period, and a five-month post-deployment evaluation period. Additional detail about the activities preceding, within, and following the two phases are provided in the sections below. The decision to implement Phase 2 will be dependent on the performance evaluation data from Phase 1, as well as the readiness of the declaration and validation mobile app. Any delay in availability of the mobile app will delay the start of Phase 2.

A high-level PIP implementation schedule is shown in Figure 11. Activities associated with each phase are also identified in Appendix B. Implementation Roadmap and Master Schedule.

3.1 Pre-Pilot Activities

The PIP includes pre-Pilot activities that need to be completed prior to Phase 1 implementation. Metro anticipates that it will take approximately eight months to complete all pre-Pilot activities. These include:

- Establishing program/project management activities.
- Finalizing the budget and schedule.
- Following-up with stakeholders.
- Coordinating with Caltrans and CHP on degradation reporting.
- Finalizing and beginning the outreach/education campaign.
- Securing vendors/suppliers.
- Coordinating with the Pay As You Go pilot program.
- Completing final design of and obtaining approval for signage changes, as well as fabricating and installing new signs.
- Collecting pre-Pilot baseline data.
- Implementing technology changes (e.g., BOS, Customer Service Center [CSC]) to support the Pilot.
- Training customer service representatives (CSR) and Metro staff.

These activities are identified further in Appendix B.

3.2 Phase 1

Phase 1 of the Pilot is estimated to begin in October 2020. Phase 1 would include:

A. Two-month “grace period” which gives commuters time to acclimate to the new occupancy requirements for toll-free travel;

B. Twelve months of full Pilot operations;

C. Five months to evaluate Phase 1 results, which will inform the decision to move forward to Phase 2; and

D. Four months for outreach and any other necessary preparations prior to beginning Phase 2 operations.

It is anticipated that Phase 1 operations would continue during (C) and (D).

It is anticipated that after Phase 1 (B), Metro staff would review the effectiveness of Phase 1 from the data analysis. Based on their findings, they will make a recommendation to the Metro Board for next steps and present a plan for transitioning to Phase 2, if warranted.

Should the decision be made not to proceed to Phase 2 at the end of (C), the Pilot would either TPO or revert to pre-Pilot operations.

3.3 Phase 2

Phase 2 of the Pilot is estimated to begin in September 2022. Phase 2 would include:

A. Two-month “grace period” which gives commuters time to acclimate to the new occupancy requirements for toll-free travel;

B. Twelve months of full Pilot operations; and

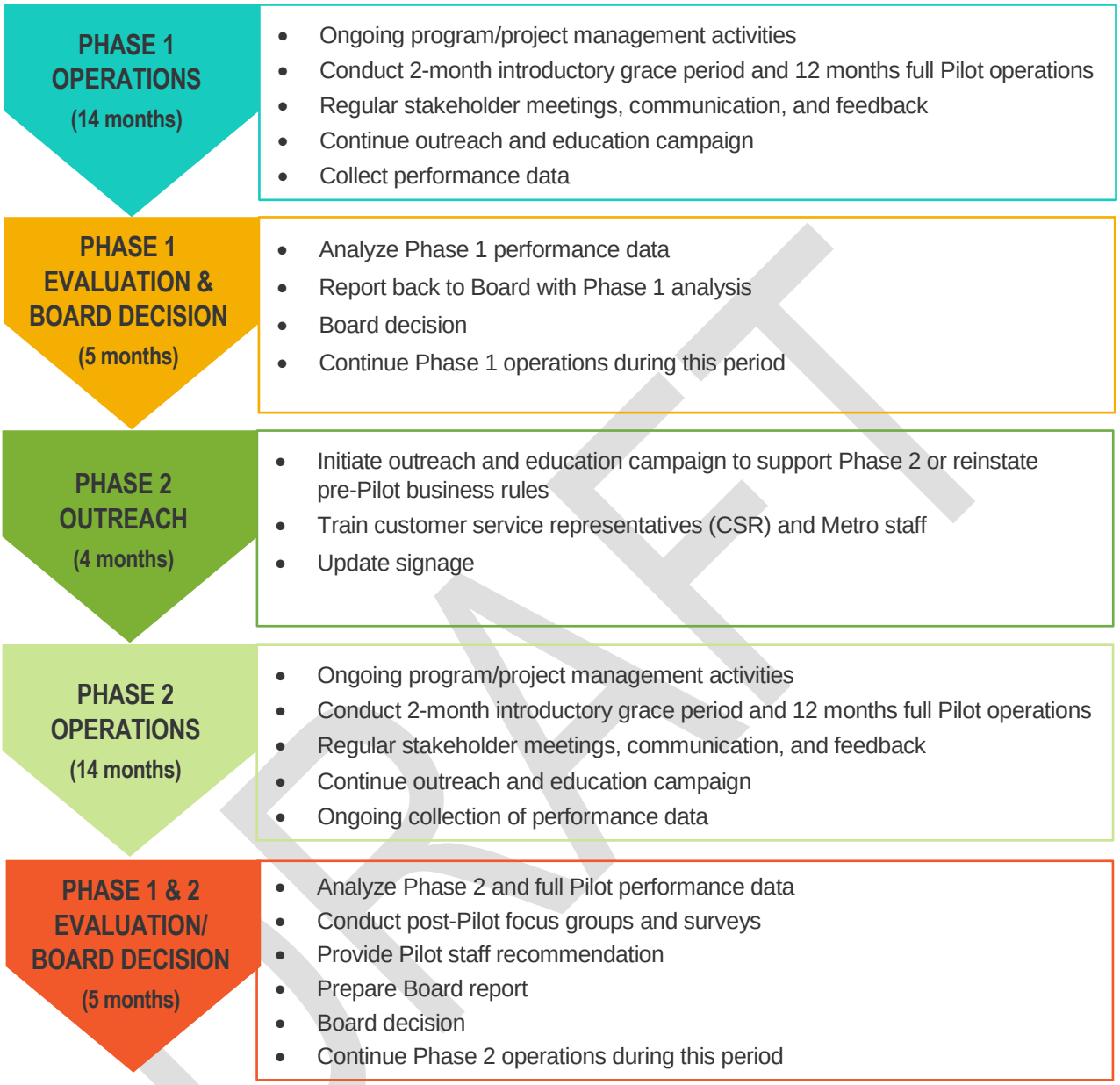
C. Five months to evaluate Phase 2 and compare Phase 1 and 2 results, which will culminate in a Metro Board decision of TPO or revert back to pre-Pilot operations.

   - It is anticipated that Phase 2 operations would continue during this time.

3.4 Transition to Permanent Operations

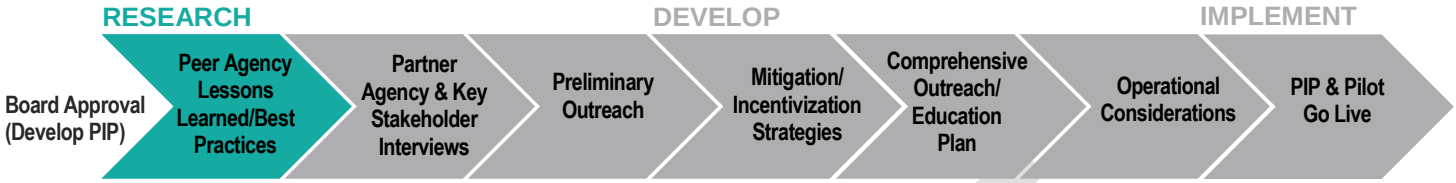
It is anticipated that after Phase 2, Metro staff will review the effectiveness of the Pilot as a whole, and they will recommend the most appropriate next steps to the Metro Board, which may include presenting a TPO plan, if warranted. At that time, the Board will decide to make Phase 1 or Phase 2 operations permanent or revert to pre-Pilot operations.

Figure 9. High-level PIP Implementation Schedule



INTENTIONALLY LEFT BLANK

4 Peer Agencies' Lessons Learned and Best Practices



This section includes an overview of managed lanes policies around the country, peer agency selection criteria, summary of all interview responses, and documents case studies and mitigation strategies for selected peer agencies who underwent similar occupancy requirement conversions.

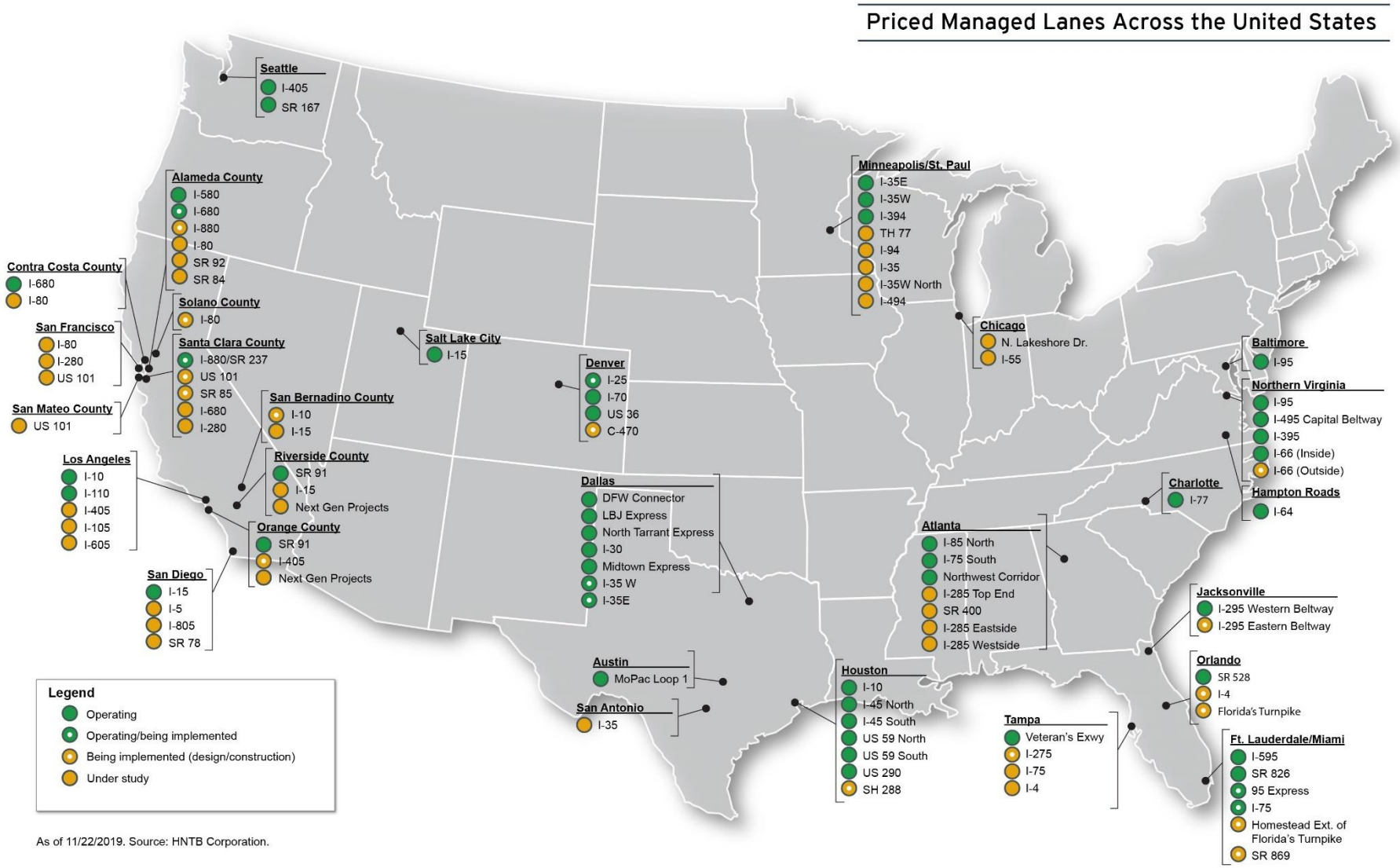
4.1 Managed Lanes and HOV Overview

4.1.1 Key Concepts

The concept of priced managed lanes has emerged as a way to address congestion in urban regions. The terms Priced Managed Lanes/Managed Lanes are often used interchangeably with Express Toll Lanes/Express Lanes (ETL/ELs) or HOT Lanes. While these terms are relatively loosely defined, with facility branding and specific definitions established by the individual operating agencies or regional policy makers, all managed lanes share the same concepts and strategies that include lane separation and regulated access, vehicle eligibility (by vehicle type or occupancy requirements) and congestion pricing with the overarching goal to offer drivers the option to pay a toll for reliable, congestion-free travel.

Managed lanes pricing frequently includes a discount, or free passage, for HOVs in accordance with each facility's HOV requirements. HOT lanes typically refer to facilities that allow vehicles with less than the specified occupancy to access the lanes by paying a toll. Most HOT lanes involve a conversion of the existing HOV-only lanes and can include HOV/HOT lane expansions. ETLs/ELs generally refer to managed lanes that, unlike HOT lanes, charge a toll on all vehicles regardless of occupancy. Typically, these are newly added lanes or the conversion of existing lanes in highway corridors with no legacy HOV lanes. A map of priced managed lanes projects in the U.S., in various stages of development, is shown on the following page.

Figure 10. Map of U.S. Priced Managed Lanes



As of 11/22/2019. Source: HNTB Corporation.

4.1.2 Overview of HOV Policies

A variety of HOV policies governing free access to managed lanes are in use by operators across the U.S. These carpool policies range from permissive HOV2+ policies to facilities with no toll exemptions for carpools (all HOVs tolled). Furthermore, access policies can vary within the same geographic region or state. The determination of a preferred carpool policy for managed lanes depends largely on individual project objectives and operational goals, performance requirements, existing carpool preferences, and legacy HOV policies in the corridor. Similarly, hours of operation differ by a project's operational goals and objectives.

Table 3 lays out managed lanes HOV policies in the states where projects are currently operational. Managed lanes owners and operators are also included for each state.

Table 3. Summary of Regional HOV/HOT Policies (by State)

STATE (OPERATING AGENCY)	HOV POLICY	NO. OF FACILITIES
California (Metro, OCTA, SANDAG, VTA, RCTC, ACTC)	• HOT lanes HOV2+	5
	• Some HOV3+ at peak periods	1
	• ETLs HOV3+ with some discounts at peak periods	2
Colorado (CDOT, HPTE, Plenary)	• HOV3+ free on all HOT lanes	2
	• I-70 shoulder lane and future state highway C-470 will not have free HOV	2
Florida (FDOT, FTE)	• HOV3+ free for I-95 converted HOV lanes	1
	• ETLs do not permit free HOV access	2
Georgia (GDOT, SRTA)	• HOV3+ free for converted HOT lanes	1
	• ETLs don't permit free HOV access	2
Maryland (MDOT)	• No free HOV access	1
Minnesota (MnDOT)	• HOV2+ free	2
Texas (TxDOT, Metro, Cintra, CCRMA, CTRMA)	• HOV2+ free	1
	• HOV2+ discounted	3
	• HOV3+	5
	• No free HOV access	1
	• Dallas/Fort Worth (DFW) area mostly has a HOV2+ peak period discount (subsidized by TxDOT for Public-Private Partnership [P3] transactions).	---

STATE (OPERATING AGENCY)	HOV POLICY	NO. OF FACILITIES
	• Katy Managed Lanes offers HOV2+ free access at peak periods only	----
Utah (UDOT)	• HOV2+ free on HOT lane	1
Virginia (VDOT, Transurban Cintra)	• ETLs have HOV3+ free access	2
	• HOT lanes are HOV2+	2
Washington (WSDOT)	• HOV2+	1
	• HOV3+ at peaks on I-405	1

4.1.3 Evolution of HOV Policies

In some regions, ongoing congestion, particularly during peak commuting hours, has resulted in significant service degradation on managed lanes. In certain cases, the growth in the underlying corridor demand and rising congestion levels, along with high rates of carpool occupancy misrepresentation (vehicles with less than the required number of persons), have all contributed to extremely high congestion levels in the managed lanes, resulting in overutilization and deterioration in speeds. In light of these challenges, public agencies around the country have been re-evaluating their vehicle exemption policies in an effort to improve traffic throughput and travel time reliability in the managed lanes and in the overall corridor.

Table 4 outlines the HOV/HOT policies of operating projects nationwide, beginning with the least restrictive access and progressing to the most restrictive access. It also includes examples of facilities where these policies are applied. Currently, there is no agency in the nation operating under an HOV5+ policy, which Metro is considering implementing on the I-10 ExpressLanes. The closest comparison is Georgia's new managed lanes capacity projects (Northwest Corridor and I-75 South Metro ELs) that allow toll-free access for registered vanpools with seven or more occupants.

Table 4. Types of HOV/HOT Policies

HOV POLICY	EXAMPLES OF OPERATING MANAGED LANES
All HOVs free (HOV2+)	**Most HOV to HOT conversions** including: • I-110 - Los Angeles, CA • I-15 - San Diego, CA • I-680 - Alameda County, CA • State Route (SR) 237/I-880 - Santa Clara County, CA • SR-167 - Seattle, WA • I-15 - Salt Lake City, UT • I-394 and I-35 W/E - Minneapolis, MN • I-66 Inside the Beltway - Fairfax County, VA***** • I-64 - Norfolk, VA

HOV POLICY	EXAMPLES OF OPERATING MANAGED LANES
• **HOV2+ free at peak periods** • **All vehicles pay off-peak**	• I-10 Katy Freeway Managed Lanes - Houston, TX**
• **HOV3+ free at peak periods** • **HOV2+ free off-peak**	**Most HOV to HOT conversions including:** • I-10 - Los Angeles, CA** • I-405 - Bellevue, WA • Houston METRO Managed Lanes (US 290 NW; US 59 Eastex; US 59 SW; I-45 North; I-45 Gulf)
• **HOV2+ pay 50% at peak periods** • **All vehicles pay off-peak**	**Mix of expansions and conversions:** • All DFW region facilities*** (regional policy; expires for P3s in 2025)
• **HOV3+ pay 50% in peak periods** • **HOV3+ free off-peak**	**Capacity expansions including:** • SR-91 - Orange and Riverside Counties, CA
• **HOV3+ always free**	**Mostly capacity expansions including:** • US 36 and I-25 - Denver, CO (partial conversion) * • Capital Beltway I-495 - Fairfax County, VA • I-95 - Northern Virginia • I-85 - Atlanta, GA (conversion)* • I-95 - Miami, FL
All HOVs pay	**Mix of recreational serving facilities (weekend only), new capacity, and conversions:** • I-70 Mountain Express Lane - Denver, CO • MoPac Express Lanes - Austin, TX • I-95 Express - Baltimore, MD • I-75S Metro and Northwest Corridor, GA • I-75 and I-595 - Ft. Lauderdale, FL

LEGEND

*****_Adopted or implemented more restrictive policies at or after managed lane inception._

******_Considering establishing more restrictive access policies._

*******_Contemplated policy changes but ultimately did not adopt such changes._

Note: *This table does not include facilities that are still under construction.*

Several agencies have either implemented a change to more restrictive access, adopted a policy that will be implemented at a later point, or chosen to delay establishing more restrictive policies.

4.2 Selection of Peer Agencies

Metro conducted a peer review of key lessons learned from other agencies that underwent similar transitions to more restrictive managed lanes occupancy policies, including observed and anticipated impacts from these changes and corresponding mitigation strategies. The purpose of this peer review was to understand how other agencies approached similar policy changes, what some of the biggest challenges were, and what mitigation strategies were proposed or adopted to make the new policies more politically and/or publicly acceptable.

4.2.1 Selection Criteria

Agencies from around the country were identified that have managed lane facilities that are either operational or under construction. The following factors aided in the selection of agencies for peer reviews and interviews:

- Implemented policy changes at the start of tolling;
- Implemented policy changes at any point during toll operations;
- Adopted a policy change with planned implementation in the future; and/or
- Considered changing the policy but have not adopted changes to date.

Selected peer agencies were interviewed to explore the rationale and objectives for the policy changes and what helped build public and political support for the change. Additional focus was given to how other agencies interacted with stakeholders and the public and what advice or lessons learned can be taken into consideration during the development of the I-10 PIP.

Table 5 provides a summary of the agencies that were selected for the peer reviews based on the above criteria. The table lists the facilities operated or overseen by the peer review agencies, type of policy change, and key recommendations.

Table 5. Peer Agency Policy Changes and Key Recommendations

FACILITY	POLICY CHANGE	KEY RECOMMENDATION(S)
Colorado DOT (CDOT) and High-Performance Transportation Enterprise (HPTE)		
U.S. 36 and I-25 Express Lanes	Switched to HOV3+ from HOV2+ less than one year after all segments were completed.	• Develop a comprehensive and strategic approach to public outreach. • Ensure all stakeholders are well-informed of the changes. • Establish effective and practical enforcement practices. • Consider re-designating the policy as Vanpool/Transit instead of a HOV5+ vehicle pool. • Adopt consistent policies across the region.
Georgia DOT (GDOT) and State Road and Tollway Authority (SRTA)		
I-85 Express Lanes (HOT Lanes)	Switched to HOV3+ from HOV2+ at HOV to HOT conversion at start of tolling.	• Adopt a customer-oriented approach. • Develop an effective branding strategy. • Build public trust through relationships with the media. • Clearly explain transit options to low-income communities. • Demonstrate transparency with reporting performance metrics. • Provide viable transit options. • Engage a strategic communications specialist. • Charge tolls on all cars, except registered vanpools and buses.
Virginia DOT (VDOT)		
I-66 (Inside the Beltway)	Scheduled to shift to HOV3+ from HOV2+ when I-66 Outside the Beltway opens in 2022.	• None at this time.
Orange County Transportation Authority (OCTA)		
405 Express Lanes	Scheduled to shift to HOV3+ from HOV2+ after the first 3.5 years of operations (estimated to open in 2023).	• Conduct a major public outreach effort.
Harris County Toll Road Authority (HCTRA)		
I-10 Katy Freeway Managed Lanes	Considering increasing HOV occupancy requirement; have not yet adopted a policy.	• Consider offering alternatives to the HOV4 (cars with less than five riders), such as equitable transit service.

FACILITY	POLICY CHANGE	KEY RECOMMENDATION(S)
Texas DOT (TxDOT) and North Central Texas Council of Governments (NCTCOG)		
DFW Region Managed Lanes	Considered policy changes in the past that were met with much public resistance and resulted in a decision to maintain current policies with no change for now.	• Engage in an education campaign to explain the trade-off between cost and occupancy.

A transition to a more restrictive HOV/HOT minimum occupancy policy can be challenging – a view acknowledged by many of the peer agencies. This challenge can be exacerbated when it is implemented after the initial start of tolling, as existing carpool preferences are more problematic to overcome. Despite that fact, agencies are focusing their efforts on finding innovative solutions to congestion challenges that have become increasingly common, especially in urban centers. Exceptionally high untolled ridership in express lanes can discourage toll paying drivers from choosing to use the lanes as the benefits of free-flow travel dissipate with high congestion while toll rates spike. When demand on express lanes is greater than available capacity, express bus service is impacted diminishing the attractiveness of this transit option as well.

A review of relevant literature shows that efficient traffic throughput on express lanes helps reduce delay and overall congestion in the corridor, including GP lanes, and it provides more reliable trip times while helping reduce emissions. When the public observes a direct relationship between agency actions on policy and improved express lanes performance, the value of the facility is better understood and accepted by all users, including carpools, transit, and toll-paying drivers.

Effective occupancy enforcement practices are critical to ensuring that express lanes deliver on their promise to provide a reliable travel option for transit services and toll-paying customers. To successfully manage traffic flow, it is essential for express lanes to limit the number of non-paying or discounted vehicles to only those that are eligible under the agency's occupancy rules. A reliable enforcement strategy and technology that accurately determines the number of occupants in the vehicle eligible for discounted or toll-free travel promotes fairness and helps disincentivize misuse. Manual enforcement is often labor-intensive, expensive, and can be challenging given right-of-way limitations in built-out areas.

Consequently, express lane operators around the country have been evaluating and adopting the use of mobile apps that allow customers to declare vehicle occupancy to supplement manual enforcement. For example, Georgia's SRTA has a mobile app (Peach Pass Go) where motorists self-declare HOV3+ occupancy to use the I-85 Express Lanes for free. In the DFW region, privately operated express lanes (LBJ and North Tarrant Express) require drivers to have a valid transponder and use a mobile app (TEXpress) to self-declare HOV2+ status before their trips. OCTA is also considering a mobile app for occupancy declaration.

In addition to using mobile apps for declaring occupancy, agencies are evaluating using mobile apps to verify that vehicle occupancy is properly declared. HCTRA and NCTCOG/TxDOT are evaluating HOV occupancy validation tools. While it is not yet clear whether mobile apps can help minimize the impacts of misuse and aid in the reduction of occupancy misrepresentation, vehicle occupancy verification technology can augment enforcement and electronic occupancy detection equipment. TxDOT is considering transitioning to a vehicle occupancy verification system due to safeguards that can detect users who exhibit a pattern of cheating.

Metro took note of the numerous references to mobile app use and is currently exploring this option for vehicle occupancy declaration. It would be subject to accuracy requirements, using a method that requires the driver and/or passengers have at least one smartphone or possibly that the driver have a smartphone and that each passenger have some type of mobile phone. A core component to the implementation strategy will be the mobile phone app for declaring and verifying vehicle occupancy for travelers on I-10 when they conduct their trips. The solution will be available to Metro account holders and to customers from other California toll agencies.

A key take-away from the peer and relevant literature reviews indicated that changing existing HOV policies is a challenging task when stricter policies are proposed. The Pilot needs a robust public awareness campaign, transparency, and accountability to help garner public support. Also, providing new options and incentives will be essential to a successful transition.

4.3 Interview Summaries

Responses provided by the peer agencies interviewed are summarized in this section and focused on what challenges may arise surrounding political and public acceptance of the new HOV policy/rule; what mitigating strategies may help overcome these challenges; and what lessons can be learned in the process (from either implementing/adopting the change or just introducing it).

4.3.1 CDOT U.S. 36 and I-25 Express Lanes

Overview

The U.S. 36 managed lanes facility (single lane per direction) extends 10 miles from Pecos Boulevard to 88th Street (Segment 1) and another six miles from 88th Street to Table Mesa Drive (Segment 2), connecting Denver to Boulder. The lanes connect to the I-25 managed lanes (two reversible lanes) that extend north from downtown Denver and intersect with U.S. 36. The managed lanes are operated by Plenary Roads Denver, LLC under a 50-year agreement. Full service commenced in March 2016 with the completion of Segment 2 construction.

- Use a switchable 6C transponder and toll-by-plate (video tolling) for an extra charge.
- HOVs **must** have a transponder for free travel.
- No discounts offered to electric vehicles; about 2,000 hybrids can use for free (long waiting list).
- Toll rates are set using time-of-day tolls. During some periods, rates must not go below the Regional Transportation District's U.S. 36 express bus fare.
- HOV3+ from HOV2+ switch was implemented about a year after the final tolling segments became operational. Only agency that has undergone a transition to a more restrictive HOV access policy after an initial operating period.
- Policy was forward looking, aimed to proactively manage future demand and produce revenue for the P3 partner that provided upfront financing.

Challenges

- CDOT was proactively implementing the conversion based on anticipated congestion in the future. Therefore, public willingness and politics was especially challenging because performance was not an issue at the time.

Mitigation Strategies

- Public engagement on the HOV2+ to HOV3+ changes began **four years** prior to implementation of the HOV3+ policy (effective January 2017).
- **One year** prior to implementation, a more comprehensive and strategic approach was used.
  - Informed stakeholders, press, legislatures, etc.
  - Modifications to the back office were initiated.
- Focused on policy change awareness and alternative free travel options.
- Actively involved state legislatures and local governments.
- Involved FHWA Division office in the process.

Lessons Learned and Recommendations

- Public involvement process was considered successful and exceeded expectations.
- Change resulted in average vehicle occupancy increases during peak periods.
- Material decline in HOV declaration when the change was first implemented.
- HOV usage has reportedly rebounded to nearly the same levels prior to conversion.
  - Recommend Metro establish enforcement practices and make the public aware of them prior to implementation.
- Bus Rapid Transit-lite[4] experienced significant ridership growth post-implementation.
- Enforcement remains a challenge, particularly on the CDOT/HPTE segments; private operator pays for two full-time enforcement officers.
- Recommend re-designating the policy as Vanpool/Transit instead of HOV5+; having different policies across the region may be confusing.

4.3.2 GDOT I-85 HOT Lanes

Overview

The I-85 Express Lanes are comprised of a 16-mile corridor that runs from Chamblee Tucker Road (just south of I-285) to Old Peachtree Road in Gwinnett County with several entrance and exit points. The primary objectives of the I-85 Express Lanes are mobility and providing an option.

- HOV2+ to HOT3+ conversion was implemented as a result of ongoing degradation of the HOV2+ lanes and the expectation that the HOV2+ lanes would be overly congested in the future and unable to provide reliable trip times.
- First HOV-to-HOT lane conversion that simultaneously introduced tolling while increasing the occupancy requirement (from HOV2+ to HOV3+) without adding additional lanes.
- Toll rates change dynamically throughout both the morning and afternoon weekday peak periods based on the toll segment with the highest demand.

[4] BRT-lite uses combinations of full BRT system elements (such as transit signal priority at strategic intersections; access to real-time passenger information; distinctive vehicles with low floor boarding; simple route layouts; and branding specific to the BRT system) whose cost is on the lower end of the spectrum.

- Transponders are required for HOVs and other toll-exempt vehicles (motorcycles, alternative-fuel vehicles, etc.).
- Required to maintain 45 mph speeds at least 90% of the time to ensure there is no degradation.

Challenges

- Performance is currently managed through dynamic price adjustments, but it has been challenging to meet the 45 mph 90% threshold.
  - Operating at about 88% of the speed requirements.
  - Received a waiver from FHWA allowing them to continue operations; obligated to report on meeting this requirement annually.
- Public saw HOV lanes as a roadway that's been already paid for (built with tax dollars); there was concern with double taxation or paying for something twice.
- Concept of electronic tolling and registering on the system was new to residents.
- Elected officials and the public were concerned about tolls getting too expensive.
- Commuters were slow to sign up for a local transponder sticker; HOV lanes were empty while the GP lanes became overcrowded.
- While the conversion was approved by the prior governor, the lanes opened to traffic less than a year into the succeeding governor's term. The previously approved region-wide plan that suggested converting all HOV lanes was no longer supported by the new governor and GDOT was encouraged to no longer pursue other conversions.
- There was a material reduction in HOV2+ because no longer saw advantage of the HOV lanes.

Mitigation Strategies

- Conducted extensive public outreach for one year prior to implementation.
- Campaign messaging focused on public education and explaining the program and transponder changes.
- Introduced a greatly expanded express bus service in the corridor along with outreach and education to employers to encourage alternative commuting including carpooling.
- Transit ridership increased by 21% in the morning and 17% in the afternoon peak periods.
- Most of the growth came from the new express bus routes that were created.
- Partnered with commuter transit bus services.
- HOV3+ toll free is not advertised on the roadway and only Peach Pass users can access the lanes for free.
- HOVs with SunPass or other transponders do not have free access.
- HOV3+ must declare electronically (via a mobile app) a minimum of 15 minutes before accessing the lanes.
- Automated enforcement system monitors where vehicles illegally cross the buffer by using a network of toll gantries installed at roughly 1/2-mile intervals along the corridor.

- Officers from the Motor Carrier Compliance Division monitor these lanes through video enforcement, invisible barriers, and other technology.

Lessons Learned and Recommendations

- Institute a customer-oriented approach.
- Adopt a strategic approach to messaging and engage a strategic communications specialist to effectively communicate and brand Metro's message.
- Develop an effective branding strategy within the communication plan to strategically approach messaging and position the agency as a service provider that aims to deliver reliable travel times to its customers.
- Build public trust through relationships with the media, including traffic reporters and local television stations.
- Clearly explain transit options to low-income communities.
- Demonstrate transparency with relevant performance metrics reporting.
- Provide viable transit options. For example, the largest most extensive conversion was the expansion of the regional bus system and park-and-ride expansions which worked together in improving transit as a viable option.
- Post-conversion, HOT3+ lanes have reduced congestion by optimizing occupancy and pricing and by providing reliable trip times and options for more motorists.
- Most two-person carpools were diverted from the HOV lane into the GP lanes after HOT lane implementation.
- Largest reduction in vehicle throughput in peak periods came from a reduction in carpools (HOV2+ and HOV3+ vehicles).
    - Indicates the HOT lane implementation may have disincentivized carpooling.
        - Carpooling declined by more than 30% in the AM peak and by 25% in the PM peak.
        - Decline in carpool retention remains unexplained.
- Since GDOT is restricted to current occupancy on I-85, all new capital projects will charge tolls on all cars (except registered vanpools and buses), which is considered much simpler to implement, operate, and message.
    - Encourage Metro to consider this option if it is not constrained by having the HOV component.

4.3.3 VDOT's I-66 (Inside the Beltway)

Currently, the lanes remain free for HOV2+ vehicles (with E-ZPass Flex), buses, motorcycles, and emergency response vehicles during peak travel periods. The lanes are free to all during off-peak periods including weekends. SOVs have the option of paying a toll to use the express lanes during peak periods. VDOT will be raising the occupancy requirement. They expect this change will move more people in fewer vehicles, relieving traffic congestion and helping the region meet federal air quality requirements.

- Conversion is anticipated to occur in 2022 when the I-66 Outside the Beltway managed lanes open to the public.
- By 2022 additional infrastructure, including 4,000 new park-and-ride spaces, will be in place to support the formation of carpools outside the Beltway, while additional transit and other alternatives to SOVs will be operational both inside and outside the Beltway.
- Change from HOV2+ to HOV3+ will make I-66 consistent with the Capital Beltway (I-495), I-95, and I-395, which are already designated HOV3+.
- I-66 Inside the Beltway (from I-495 to Washington, D.C.) will also change to HOV3+ when the managed lanes open on I-66 Outside the Beltway.

4.3.4 OCTA's 405 Express Lanes

Overview

OCTA, in cooperation with Caltrans, is widening 16 miles of the San Diego Freeway (I-405) between SR-73 and I-605. The project includes adding one GP lane in each direction between Euclid Street and I-605 and making improvements to freeway entrances, exits, and bridges. In addition, the project will add the 405 Express Lanes, incorporating the existing carpool lanes and a new lane in each direction between SR-73 and I-605. Because of the high demand for the I-405 and the need to stay within the existing right-of-way, the project cannot add additional lanes beyond the current expansion.

- Two goals of the 405 Express Lanes are:
  - Balance capacity and demand to serve customers who pay tolls, as well as those who rideshare or use transit; and
  - Generate sufficient revenue to sustain the financial viability of the managed lanes.
- The managed lanes portion of the project will be financed and primarily paid for by those who choose to pay a toll and use the 405 Express Lanes.
- The first 3.5 years after the express lanes open, HOV2+ will be exempt from paying tolls during non-peak hours and HOV3+ will be exempt during peak hours.
- After the first 3.5 years, HOV2+ carpools will be tolled during all hours and HOV3+ carpools will continue to be toll-free.
  - Would not have been able to finance the road without this change in occupancy requirement.
- At this point, OCTA is planning to treat zero emission vehicles similarly to HOV3+ vehicles (allow free travel), but they will still require a transponder.
  - OCTA will comply with legislation when the 405 Express Lanes open in 2023.

Challenges

- Determining the occupancy requirement for I-405 was the main issue raised by corridor cities.
  - Currently an HOV2+ facility, which was driven by corridor and corridor cities protesting changing the existing requirement.

Mitigation Strategies

- Extensive community outreach program – numerous informational and educational meetings were held as the project was going through the Project Approval/Environmental Document process.

- Expect to conduct a major public outreach effort again in 2023 when construction is completed, and the project opens.
- Dedicated I-405 outreach team as part of the Design-Build team; they have not been fielding many questions on toll policy during construction.
- Outreach and public awareness regarding the HOV discount policy will be key to the roll-out plan.
- To help minimize consumer costs and incentivize carpooling, if a HOV3+ sets up a HOV-only account, the monthly minimum account fee is waived.
    - OCTA does not offer any low-income or equity considerations.
- Exploring apps for occupancy declaration.
- Anticipate the change in Metro's HOV5+ Pilot policy could ease some public concerns on HOV3+ in Orange County.

Lessons Learned and Recommendations

- Because the SR-91 Express Lanes has had a HOV3+ requirement in place for more than 20 years, OCTA staff thought having the same requirement for the I-405 Express Lanes would be an easy sell with its Board and with the community. This was not the case.
- The three-person plus definition of a carpool was seen as a benefit being taken away, hence the 3.5-year HOV2+ buffer period.
- HOT3+ facilities are difficult to enforce, and collections costs are high. California Highway Patrol (CHP) enforcement deters occupancy misrepresentation, but enforcement only goes so far towards modifying behavior.

4.3.5 HCTRA's Katy Managed Lanes

Overview

HCTRA, Metropolitan Transit Authority of Harris County (Houston METRO), and TxDOT cooperatively developed the I-10 Katy Freeway Managed Lanes project, a four-lane tolled facility (two permanent lanes in each direction) that allow HOVs and buses toll-free access during peak periods. The Katy Managed Lanes project coincided with the planned reconstruction of the Katy Freeway and was completed in 2008. The reconstruction project added capacity to the GP lanes, added managed lanes, and upgraded the entire facility to current design standards.

The Katy Managed Lanes is 12 miles long and is separated from the GP lanes by flexible pylons and a 22-foot buffer. HOV2+, buses, and motorcycles are allowed toll-free travel in both directions during weekday peak periods. This is consistent with the prior HOV access policy (as a single-lane reversible HOV lane, there had previously been a HOV3+ occupancy requirement during each of the AM and PM peak hours). At each toll plaza there are declaration lanes. The inside lane is designated for HOV vehicles who do not pay a toll in the peak periods while the lane closer to the GP lanes is for SOVs who must pay a toll at all times.

- Facility is open in both directions, 24 hours, 7 days a week, and 365 days a year through use of electronic tolling for SOV customers.
- Main operating objective is to maximize throughput.
- Intended to give commuters additional travel choices.

- Whether the commuter chooses transit, carpool, or SOV with a toll, the facility should provide a reliable trip time.
- Per operational agreements, the facility is required to provide Level of Service C, although this requirement is not well defined and is not being met consistently. It has been challenging to meet this requirement as traffic volumes continue to increase.
- HCTRA is considering recommending an increase of passengers for HOV (toll exempt) which is not a policy change. The increase in passengers for HOV is identified in the governing documents as a measure that should be considered before increasing the toll rates to add capacity to the facility. This measure could help reduce the challenge with current HOV validation practices.
- Some operational fixes would likely improve some of the areas where some performance issues exist.

Challenges

- Since opening in 2008, HCTRA has changed the time-of-day pricing twice (2012, 2013) and have not adjusted since to manage congestion levels.
    - Gradual climb in congestion after these toll increases were implemented.
    - Believe the declaration lanes have caused some performance issues.
- Have not yet transitioned to a more restrictive vehicle access policy; anticipate those drivers who would be restricted could potentially pose strong opposition to changes if policy makers do not embrace or understand the approach to solving the issue or even the issue itself.
    - Most challenging aspects would be public, stakeholder, or political opposition and enforcement issues.
        - Difficult to pinpoint the current violation rates but are estimated at around 50%.

Mitigation Strategies

- Interested in learning from others regarding what worked and what did not.
- HCTRA, Houston METRO, and TxDOT comprise the Katy Managed Lanes Operating Committee and have been meeting monthly to discuss proposed solutions.
    - Issues discussed include a possible toll increase to cover inflation, as well as operations and maintenance and occupancy changes.
    - Consistent toll rate modifications are also being considered. FHWA has not been involved in the committee and is not actively involved from a performance standpoint.
- If policy changes are implemented, occupancy misrepresenters would be encouraged to use transit, carpool, pay a toll, or use the GP lanes.
- Marketing campaign will highlight the opportunity for carpools to split the toll rates.
- Acknowledge the need for better enforcement and is evaluating HOV occupancy validation tools such as GoCarma.

Lessons Learned and Recommendations

- Suggest Metro consider offering alternatives to the HOV4- (cars with less than 5 riders), such as equitable transit service.

- Implement measures to manage the toll customer capacity, such as effective occupancy enforcement and congestion pricing.
- After seeing positive public feedback from the Katy Managed Lanes, Houston METRO converted most of the HOV facilities in the region to HOT lane operations on weekday peak periods. The lanes were well received with travelers requesting to use them during off-peak periods and weekends. In 2015, Houston METRO conducted a pilot test to expand the hours of operation.
    - Despite the overwhelming public demand for extending the HOT lane hours of operation, the Board of Directors ended the pilot and reverted to normal operation, citing a high cost to extend the toll systems integrator contract and fewer drivers using the lanes during those hours.

4.3.6 TxDOT's DFW Managed Lanes

Overview

TxDOT operates or sponsors (through a P3) several managed lanes facilities in the DFW metroplex with varying revenue/operational objectives based on the project's attributes, such as if it is financed with debt and what the predominant user profile is. The Regional Transportation Council's (RTC) policy for P3 projects is revenue maximization; a similar policy governs TxDOT's I-35E project since it is debt financed. Conversely, the DFW Connector and I-30/Tom Landry Managed Lanes are not debt financed and are geared towards throughput maximization. The RTC, as the transportation policymaking body for the DFW region, established a tolled managed lanes policy for the region.

- Market-based tolls generally escalate every year.
- Toll rate soft cap (max toll rate per mile) can be exceeded under certain traffic conditions.
- HOV2+ drivers receive a 50% discount during defined peak periods, which is contingent upon having a valid transponder and using the app to self-declare 15 minutes prior to entering the facility.
- Transit vehicles ride for free.
- Tolls are assessed to maintain a minimum speed of 50 mph.

Challenges

- Existing carpools were resistant to an increase in vehicle occupancy from HOV2+ to HOV3+.
- HOV3+ policy was instituted with phasing starting in 2016, but there was resistance from the public and elected officials, who ultimately directed the continuance of HOV2+.
    - HOV3+ could be phased in potentially starting in 2026.
    - Backlash stemmed from elected officials concerned with public perception of a seemingly imposed extra tax.
- Elected officials are mostly concerned about toll rates getting too high when violating the soft cap. This has not been a real issue yet as speeds are rarely below 50 mph (only 2% of the time).
    - Only exception is I-635 (single HOV lane converted to HOT lane) on the east side. It operates differently than the other facilities with HOV2+ that have free access to the HOT lane at all times. This, and the high violation rate of around 50%, results in overcrowding and service degradation.

- Enforcement has been an enormous challenge in this region with 30-50% violation rates. The Dallas County Sheriff enforces HOVs and managed lanes.
    - When tickets are issued in the managed lanes, they get tossed out in court.
    - Only pull drivers over if they commit another violation – not for a straight occupancy violation.
    - Fort Worth Sheriff won't enforce toll violations because of the safety risk on those corridors.
    - NCTCOG bought vehicles and equipment for the Sheriff, but they want out of the enforcement business altogether.

Mitigation Strategies

- HOV receives a 50% discount in peak periods and the NCTCOG pays the other half of the toll to make the private developer (Cintra) whole.
    - Adopted to limit risks to the private development process since it hurts the agency's ability to leverage private sector investment.
- From 2006-2009, NCTCOG started to prepare elected officials that HOVs would no longer be free in new corridors because NCTCOG cannot continue paying forever. NCTCOG allocated $17 million to pay the HOV discount and determined that would be depleted in four years.
    - Since the app is not being used as much as they thought, NCTCOG isn't paying as much as originally thought. Therefore, they are still using the original $17M budgeted. When the money runs out there will need to be a discussion about adding more funds or changing exemptions/discounts for the lanes. The discount for HOV2+ on P3s expires in 2025.
- NCTCOG is considering another app (GoCarma) that will not require declaration and is a more passive system. There are safeguards in the GoCarma app, and it can detect if there are users exhibiting a pattern of cheating and can take action.
- To improve performance metrics, a procedure was implemented for toll rates to go beyond the soft cap when conditions deteriorate, and managed lane speeds continuously drop below the 50mph threshold when certain conditions are met.

Lessons Learned and Recommendations

- Experience is limited in terms of understanding true politics.
    - Occupancy change has been tabled on all corridors at this time.
- Recommend engaging in a public education campaign to explain the trade-offs between cost and occupancy.

4.4 Findings/Recommendations

A key take-away from the peer and relevant literature reviews indicates that changing existing HOV policies is a challenging task when stricter policies are proposed, and a conscientious public outreach/education campaign is imperative to the success of a policy change. When comparing interview responses, numerous commonalities emerged as essential to a successful transition:

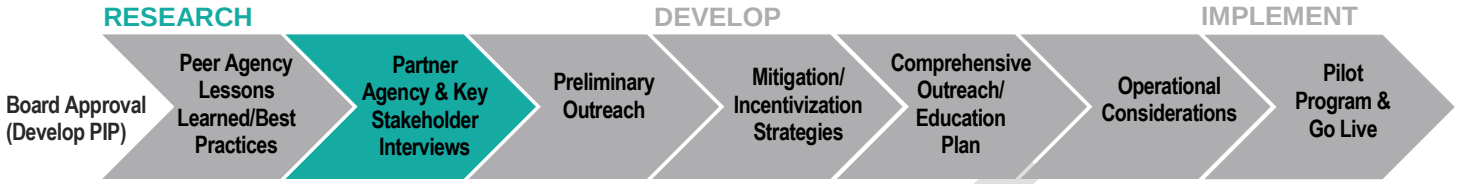
- Increasing minimum occupancy is extremely challenging.
- Obtaining political support is key to successful implementation because elected officials and key communicators can help explain, answer questions, and communicate to the public which will help extend the reach of the outreach/marketing campaign.

- Conducting extensive public outreach; developing a robust public awareness/education campaign; and thoroughly educating the public on the new requirements prior to implementation.
- Demonstrating transparency and accountability with relevant performance metric reporting.
- Implementing mitigation strategies to help make the transition to and implementation of new requirements as easy as possible, and offering incentives the ExpressLanes users to form vehicle pools, increase transit usage, etc.
- Providing viable transit service options.
- Coordinating proactively with FHWA, Caltrans, CHP, and local government officials.
- Establishing practical enforcement practices and thoroughly educate the public prior to implementation.

Metro understands that an extensive outreach/education campaign will be needed to thoroughly communicate the policy change to the traveling public and to stakeholders, especially since the I-10 and I-110 corridors have different HOV policies and business rules specific to each facility. Therefore, the Pilot's outreach/education campaign should minimize confusion surrounding the policy change being applicable to the I-10 only, ensure the change is understood, and provide various options/tools to help commuters adjust to the switch and find vehicle pool companions.

To help garner public support, Metro will develop a strategic messaging campaign to help build awareness and consensus and consistently message the need and benefit of the Pilot prior to implementation. Part of that messaging is demonstrating that Metro understands that creating 5+ vehicle pools may seem difficult at first, and it wants to balance that out by creating an effortless occupancy declaration solution.

5 Partner Transit Agencies and Key Stakeholders



5.1 Partner Transit Agency Interview Summaries

Metro requested feedback from partner transit agencies (shown in Table 6) that may be affected by this change since they frequently utilize the ExpressLanes segment of the El Monte Busway, which is a direct connection to the El Monte Station. Six agencies were contacted; four responded and were interviewed or provided feedback (Metro, Foothill Transit, Norwalk Transit, and Greyhound Lines). Metro was unable to connect with the other two agencies (LA Philharmonic Association/Hollywood Bowl and El Monte Shuttle/Trolley) for an interview and/or feedback. These partner transit agencies were selected for interviews because they have service lines between Union Station and El Monte Transit Station at the eastern terminus of the I-10 ExpressLanes.

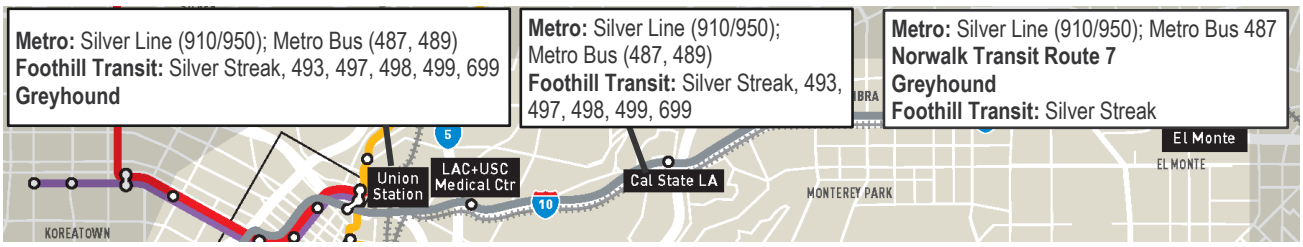
The interview questions were focused on:

- Understanding current operations and future potential impacts of the I-10 Pilot Program on their operations;
- Asking for suggestions on potential mitigation strategies for any significant negative impacts; and
- Identifying how much lead time each partner transit agency would need to inform and prepare for any potential operational changes when notified of the final Pilot details.

Each of the partner transit agencies were receptive to the idea of this Pilot Program for the I-10 ExpressLanes and had a positive response towards it. There was general consensus that the Pilot would be beneficial to their existing transit service and operations, shown as Benefits and Key Success Measures in Table 6. Both positive and negative feedback on the Pilot Program's potential impacts on their operations was received, as well as the perceived views of ExpressLanes users and the potential impacts of the Pilot on the GP lanes. Overall, they agreed the Pilot would have more benefits than negative impacts to their transit services and operations. Also, they expressed that if headways are improved and there is an increase in ridership because of the Pilot Program, they would adjust bus schedules accordingly to accommodate additional riders. Table 6 summarizes the interview responses from these partner transit agencies. A map with service lines is included below.

Figure 11. Service Line Stops: El Monte Station to the El Monte Busway and Alameda Stop

Source: https://media.metro.net/projects_studies/silverline/images/map_silverline_overview.pdf



Metro

Table 6. Partner Agency Interview Summaries

BENEFITS	KEY SUCCESS MEASURES	EXISTING CHALLENGES	POTENTIAL IMPACTS OF PILOT	SUGGESTED MITIGATION STRATEGIES
Metro | *Wayne Wassell,* Transportation Planning Manager I-10; *Scott Greene,* Transportation Planning Manager I-110 **Service Lines:** Silver Line: 910, 950; Metro Bus: 487, 489				
• Travel time improvements would increase ridership, making it more convenient for riders.	• Maintaining 45 mph at all times. • Faster travel times overall. • Attracting more transit riders.	• I-10 starts off as one lane. • Buses exit the El Monte Transit Station onto the ExpressLanes where I-10 becomes two lanes until I-710 when it returns to one lane which causes bottlenecks. • Only one lane all the way to downtown Los Angeles. • Traffic queues at the Alameda Station cause traffic to back up in the ExpressLanes.	• No negative impacts to the public transportation system since the Pilot Program would reduce congestion for buses. • If there is a substantial increase in ridership and additional buses need to be purchased, this could take up to two years. • Potential for increased parking demand at the El Monte Transit Station. • Use the ExpressLanes to return empty buses to the station (deadhead) and do not want this prevented for any reason.	• Metro proactively notify agencies of construction activities at Union Station since construction delays directly impact transit service and operations. • Explore possibility of reconstructing existing parking structure behind the El Monte Station to meet increased parking demands.

BENEFITS	KEY SUCCESS MEASURES	EXISTING CHALLENGES	POTENTIAL IMPACTS OF PILOT	SUGGESTED MITIGATION STRATEGIES
Foothill Transit | *Joseph Raquel,* Director of Planning **Service Lines:** Silver Streak; Other: 493, 495, 497, 498, 499, 699				
• Increased speed and more reliable service may entice commuters in GP lanes to view transit as a more viable alternative.	• Maintain increased average speeds. • On-time performance. • Growth in ridership. • Reduced operating costs. • Contractors are paid by revenue hour and revenue miles. If travel speeds are faster, revenue hours would go down, but revenue miles would remain the same resulting in greater revenue.	• Montclair to Downtown Los Angeles route (Line 699) has seen a reduction of speeds from 32 to 24 mph over the last several years. • At times, ExpressLanes seem slower than GP lanes. • As congestion slows down operations and travel speeds, there is a negative effect on operation costs and ridership, especially since operations are contracted out and contractors are paid by revenue hour and revenue miles. • Ongoing Caltrans construction projects (e.g. pavement rehab/ repairs) hinder bus operations within the corridor. • Currently preparing a white paper about construction impacts on bus service.	• Potential to reach crush loads would positively influence the need for addition of services. • Reduction in schedule slack could provide more reliable service. • Greater efficiency will increase service, including increasing capital costs if more vehicles need to be added while maintaining the same headways.	• If there is a need to increase services and capital costs associated with purchasing vehicles, explore the possibility of having resources, in the form of grants, that agencies can draw from to address increased demand.

BENEFITS	KEY SUCCESS MEASURES	EXISTING CHALLENGES	POTENTIAL IMPACTS OF PILOT	SUGGESTED MITIGATION STRATEGIES
Norwalk Transit | *Derek C. Donnell,* Transit Operations Manager **Service Line:** Route 7				
• On-time performance. • Reduced traffic in ExpressLanes. • Faster headways. • Increased operating speeds.	• Any time traffic is reduced and there is an increase in on-time performance there is a benefit. • Pilot Program could potentially have a positive effect on increasing ridership, getting people out of their cars and on buses.	• Do not use the ExpressLanes but do use I-10 to and from the El Monte Station and Rio Hondo College, which is a one-way trip with passengers and deadheads in the opposite direction (back to the El Monte Station).	• There would likely be no potential impact. • This change could create more traffic/ congestion in the GP lanes and increase traffic on local streets as drivers find other routes.	• No mitigation strategies identified since there are likely no negative impacts.
Greyhound Lines | *Juan Castro*, Western Region Agency Manager **Service Line:** Numerous long- distance, cross-county lines				
• It could be expected that with this change, there will be a decrease in the number of vehicles in the HOV lane which will benefit Greyhound.	• If buses arrive five minutes faster, less fuel is used, and passengers are happy.	• Traffic congestion for east/west travel on the I-10 will likely not affect Greyhound lines in the HOV lane.	• GP lanes will experience heavier traffic volumes which may cause drivers to use the HOV lane regardless of the 5+ requirement.	• No mitigation strategies to offer at this time.

5.1.1 Transit Agency Coordination and Implementation Plan

Partner transit agencies were satisfied with the current level of coordination with Metro and believed a 6-month (minimum) notification prior to the Pilot's implementation would be sufficient.

5.2 Key Stakeholder Interview Summaries

Feedback was also requested from the following key stakeholders to ensure their concerns were being acknowledged and addressed to the extent possible with respect to this Pilot Program.

- Caltrans District 7, Division of Traffic Operations and Design
- Caltrans Headquarters
- FHWA
- CHP

These key stakeholders have all been engaged since the planning and opening of the ExpressLanes in 2013. Responses to the potential benefits are summarized in Table 7.

The interview questions were focused on:

- Understanding the concerns/issues raised by the stakeholder's customers/clients/constituents;
- Linking KPIs to before and after metrics to evaluate the success of the Pilot; and
- Identifying the potential benefits of increasing the occupancy requirement for toll-free travel.

The stakeholders identified several benefits along with KPIs. Most of the stakeholders felt the ExpressLanes system is effective in reducing overall congestion and improving travel times on I-10. They also acknowledged that the ExpressLanes are more efficient than GP lanes. However, some Caltrans staff pointed out that prior to implementation of the ExpressLanes system, congestion in the HOV lanes was not an issue and they were not included in the HOV degradation report. According to Caltrans staff, data shows that on I-10, 70% of vehicles using the ExpressLanes are SOV and 30% are misrepresenting occupancy.

Table 7. Key Stakeholder Interview Summaries

BENEFITS AND/OR CONSTRAINTS	KEY PERFORMANCE INDICATORS (KPI)	ISSUES REGARDING TRAVEL WITHIN CORRIDOR	CONCERNS REGARDING CHANGE IN OCCUPANCY	SUGGESTED MITIGATION STRATEGIES
Caltrans District 7 | *Shafiqul Islam,* Chief - Division of Traffic Operations				
• 5-person carpools are much harder to form than 3-person carpools. • Normal-sized vehicles can't fit five people comfortably.	• Success can be measured by travel time delay, speed, effect on GP lanes, improved bus service and operations, and number of carpoolers achieving 5+ passengers.	• Concerns mostly about the adequacy of signage and maintenance.	• ExpressLanes are operating well now and are still faster than GP lanes; however, if increased occupancy requirements force drivers out, it will be detrimental to GP lanes and potentially, overall throughput. • Typical vehicle only fits a small number of passengers (three to four) comfortably. • Currently, only 3% of vehicles are declaring HOV3+ and increasing occupancy requirements will only make carpooling more challenging.	• Increase enforcement. • Consider tolling CAVs to improve operations. • Consider a phased approach, for example start with an increase in occupancy requirements to HOV4+. – Review before/after data and then consider increasing to HOV5+ based on performance data.

BENEFITS AND/OR CONSTRAINTS	KEY PERFORMANCE INDICATORS (KPI)	ISSUES REGARDING TRAVEL WITHIN CORRIDOR	CONCERNS REGARDING CHANGE IN OCCUPANCY	SUGGESTED MITIGATION STRATEGIES
Caltrans District 7 | *Deborah Wong,* Caltrans District 7 Deputy Director (Interim) - Division of Traffic Operations *Dawn Helou,* Senior Transportation Engineer				
• Benefit is for the buses and toll users. – 30-40% of commuters are already paying the maximum toll at peak times (*Metro data shows 0.60% of users have paid the maximum toll of $22.50 on I-10*). – Tolls would decrease since the pricing algorithm is based on ExpressLanes excess capacity.	• Maintain 45 mph in ExpressLanes. • Study increase in person throughput either on buses or vanpools, not just vehicle throughput. • Measure increased transit use. • Research metrics regarding significant vanpool growth.	• Most issues raised by constituents are cosmetic in nature, like graffiti and litter. • In the past, Metro expressed concern over any closure of the HOT lanes (e.g. proposed repairs to the bridge near California State University, Los Angeles).	• Potential that 60% of volume (current 2+/3+ carpools) would return to GP lanes leading to further degradation (40% currently paying the toll). • Concerned remaining carpoolers will dissolve due to lack of incentives, adding more vehicles to GP lanes. • Not enough access points and cars get stuck in the ExpressLanes and/or GP lanes. • Would like option to continue to use the ExpressLanes for traffic management (e.g. during major incidents), but if there will be barriers (channelizers) as part of this change, all vehicles would be stuck in GP lanes. • Concerned about traffic increases in the summer and from tourists; they will not have registered 5+ transponders.	• Improved occupancy validation, enforcement, and video detection would make the ExpressLanes more effective. • Later this year, a pilot program will be implemented that includes mounting display panels over the ExpressLanes. They will display the self-declared occupancy entered on the transponder as 1, 2, or 3 to assist CHP enforcement. – Will pick up drivers' declarations on transponders and display them over the lane. – Also, automated video detection systems will be tested in a pilot on I-10 by the end of the year. • Develop incentives to keep current 2+/3+ carpools together.

BENEFITS AND/OR CONSTRAINTS	KEY PERFORMANCE INDICATORS (KPI)	ISSUES REGARDING TRAVEL WITHIN CORRIDOR	CONCERNS REGARDING CHANGE IN OCCUPANCY	SUGGESTED MITIGATION STRATEGIES
Caltrans Headquarters | *Joe Rouse,* Chief - Office of System Operations				
• May see a reduction in vehicle misrepresentation. Depending on the structure of how many people will claim toll exempt status through an app, cheating might go down.	• Person throughput on the ExpressLanes, GP lanes, and for the entire corridor. • Speeds and volumes in GP lanes and ExpressLanes.	• Perceived environmental justice issues for carpoolers along this corridor.	• What will happen to GP lanes if most vehicles that don't qualify move over from the ExpressLanes? • How many people will stay in their carpools and what is the expectation they will continue to carpool?	• Provide additional support and incentives for vehicle pools. • Increase transit service.

BENEFITS AND/OR CONSTRAINTS	KEY PERFORMANCE INDICATORS (KPI)	ISSUES REGARDING TRAVEL WITHIN CORRIDOR	CONCERNS REGARDING CHANGE IN OCCUPANCY	SUGGESTED MITIGATION STRATEGIES
FHWA | *Jesse Glazer,* ITS & Operations Engineer for Southern California				
• If it controls occupancy misrepresentation to a very low level (<5%), degradation would be eliminated. • Bus riders, carpoolers, and vanpoolers would find the ExpressLanes more attractive, so their numbers would probably grow, and person-throughput would increase.	• Minimum average operating speed should be used. • Person throughput in the peak-hour and peak-direction in each of the two major segments (I-605 to I-710 and I-710 to Union Station).	• Based on information from Caltrans' 2017 HOV Degradation Report, the Busway/HOV-lane was not congested prior to conversion to ExpressLanes. After conversion, it became degraded and has remained so for several years. Hence, travel times have increased significantly. • Increased and regular congestion. • Congestion pricing is not able to manage demand. • Violations are not controlled effectively.	• Privacy objections resulting from the (potential) registration and validation for "vanpoolers" and (potential) cell-phone occupancy-declaration process. • Loss of existing carpools from HOV3+ to HOV5+ change. • Loss of vanpools resulting from bullet #1. • Will financial penalties be enough to deter "choice" violators? • There are multiple ways to violate. What preventive measures will be taken? Will they be effective?	• Increase enforcement to reduce vulnerability to cheating. – Compare actual self-declaration count data obtained by Caltrans or Metro to confirm existing violation data.

BENEFITS AND/OR CONSTRAINTS	KEY PERFORMANCE INDICATORS (KPI)	ISSUES REGARDING TRAVEL WITHIN CORRIDOR	CONCERNS REGARDING CHANGE IN OCCUPANCY	SUGGESTED MITIGATION STRATEGIES
CHP | *Sergeant Paul Duran; Officer Rubio*				
• If drivers are properly educated prior to the transition, the change may be more successful because there may be less occupancy misrepresentations.	• Continue collection of enforcement data and citation data to track occupancy misrepresentation.	• Some motorists consider the ExpressLanes the "Lexus Lanes," so it is already viewed by some as a convenience for the privileged. • Push back was received on the zero emissions vehicles being allowed to use the ExpressLanes. • Public perception is that with the passing of the last Metro initiative, Metro has more money going back to itself while continually taking away from people and not giving anything in return.	• Critical to properly educate motorists prior to implementation of the Pilot. • Message must be clear and concise and explain what exactly the Pilot is about and why the occupancy change is happening.	• Conduct a strong education program prior to implementation to help curb violations. • Consider implementing a grace period prior to full implementation. • Consider adding physical barriers to make the ExpressLanes easier to enforce. • Improve readers and displays on gantries to make it easier for CHP to enforce.

5.2.1 Public Support

The key stakeholders generally agreed that public support for this occupancy change would be challenging since meeting the existing high occupancy vehicle requirement (2+/3+) for the ExpressLanes is already challenging. Challenges to public acceptance of occupancy requirements for toll-free travel in the ExpressLanes were attributed to the following perceived public sentiments:

- GP lanes are congested already and cannot absorb 2+/3+ ExpressLanes users that may no longer want to use the ExpressLanes due to now having to pay tolls.
- General feeling is the public already pays taxes for carpool lanes; now asked to pay again.
- Perception that only the wealthy can afford to use the ExpressLanes.
- Carpools (2+/3+) are being punished instead of those misrepresenting occupancy.

To build public support, the following suggestions were made:

- Increase transit service to make it a more viable option.
- Build park-and-ride lots east of Santa Anita or increase parking capacity at El Monte Station since the lot is full.
- Have low-income[5] discounts and toll credits to use on public transportation.
- Run a 6-month awareness campaign.

5.2.2 Mitigation Strategies

To make the new policies more acceptable, the following mitigation strategies were proposed by interviewees and evaluated in Section 7. PIP Support Strategies:

- Improve enforcement of the ExpressLanes.
- To dissipate congestion during the peak hours, consider off-peak HOV2+/3+ carpools go for free. This provides the option for people to travel before and after peak hours.
- Maintain existing HOV2+/3+ carpools if traveling outside peak hours.
- Provide additional support for vanpooling through education and programs.
- Increase frequency of transit service like Foothill Transit and Metro Silver Line.
    - Examine the corridor as a whole. Short-term strategies would include ramp metering and long-term strategies would include operational improvements.
- Consider a phased approach – instead of jumping to HOV5+, start with HOV4+ and see how it performs for six to 12 months and compare metrics from before and after. HOV4+ would be more acceptable and easier to form carpools, especially considering standard vehicle size fits three to four passengers.
- Suggest making it HOV5+ at all times to minimize confusion.
- Education program should clarify peak vs. off-peak occupancy requirements, if needed.

[5] Metro's HOT program uses the thresholds required for state and local aid programs. See the Metro ExpressLanes website (https://www.metroexpresslanes.net/en/about/plans_lowincome.shtml) for annual household income requirements.

- Suggest charging a flat fee for two-axle box trucks (e.g. 24-26' U-Haul-type trucks) since there is an increased number of them using the ExpressLanes.

5.2.3 Key Stakeholder Coordination

Should the Pilot Program be implemented, the level of coordination and participation for each stakeholder is anticipated to be as follows:

Table 8. Level of Coordination with Stakeholders

STAKEHOLDER	LEVEL OF COORDINATION
Caltrans District 7 *Shafiqul Islam* Chief, Division of Traffic Operations	It is anticipated there will be extensive coordination and face-to-face meetings with Metro and its Congestion Reduction Group.
Caltrans District 7 *Deborah Wong* Caltrans Deputy District 7 Director Division of Traffic Operations (Interim) *Dawn Helou* Senior Transportation Engineer *Derek Higa* Assistant District Division Chief, Design	Ongoing coordination is anticipated.
Caltrans Headquarters *Joe Rouse* Chief, Office of System Operations	Close coordination and status updates are anticipated.
FHWA *Jesse Glazer* ITS & Operations Engineer for Southern California	FHWA is available, at the request of Metro or Caltrans, to offer review-and-comment assistance during the design of technical elements of the PIP or to respond to any questions regarding performance compliance.
CHP *Sergeant Paul Duran* *Officer Rubio*	Ongoing coordination is expected. It would be beneficial to have a 3-month education/grace period where there isn't enforcement.

Table 9. Key Stakeholder List and Responsibility Matrix

STAKEHOLDER	RESPONSIBILITY
Caltrans District 7	• Approve updated signage plans • Coordinate for implementation • Data collection for before and after metrics • Amend Caltrans ExpressLanes maintenance agreement to include: removal of existing signage from median barrier, replacement of Pilot Program signage, maintenance of signage during pilot period, and any post-pilot signage removal and replacement
Caltrans Headquarters	• Approve updated signage plans • Review before and after metrics
FHWA	• Approve updated signage plans • Review before and after metrics • Public outreach and education, as needed
CHP	• Public enforcement and subsequent education, as needed • Data collection for before and after metrics

By the end of the year, Metro in coordination with Caltrans, anticipates the implementation of a pilot to test the placement of display panels under transponder readers, which will pick up drivers' declarations on the transponders and will display them over the lane, which should be easier for CHP officers to see/read.

Another option being considered is using a self-declaration mobile app, which can alleviate the challenges related to occupancy enforcement by using technology that can detect and verify the number of occupants.

CHP recommended a meaningful education program prior to and an introductory period for the first few months after implementation to help curb violations. They also recommended adding a solid, physical barrier to make it easier to enforce people crossing in and out of the ExpressLanes.

Valuable information was received from the key stakeholders in terms of benefits/constraints, KPIs, issues, concerns, public support, and mitigation strategies. It is anticipated that Metro will have different levels of involvement and coordination with key stakeholders throughout the Pilot Program, which will be imperative to its success.

5.3 Findings/Recommendations

5.3.1 Partner Agency Findings/Recommendations

Each partner agency interviewed brought a unique perspective regarding how the potential HOV5+ occupancy requirement may affect their service and operations. Increasing speeds and decreasing travel times and operating costs were important benefits. They are focused on providing more reliable travel times, keeping commuters happy, and potentially increasing transit ridership. However, there are several challenges that are inhibiting these goals, all stemming from congestion on the ExpressLanes as well as the I-10 GP lanes. For example, Foothill Transit has seen a reduction of speeds from 32 to 24 mph over the last several years on the Montclair to Downtown

Los Angeles route (Line 699). At times, the ExpressLanes seem slower than the GP lanes, which does not encourage people to ride transit instead of traveling in a car. However, if the HOV5+ requirement reduces congestion in the ExpressLanes, buses may travel faster than the GP lanes which may entice people to ride transit rather than drive.

If the Phase 1 transit only and Phase 2 HOV5+ requirements are implemented, it may have financial ramifications due to agencies needing to purchase more buses and hire additional operators and staff, if there is a significant increase in transit ridership. It was suggested that these increased capital costs may be offset by resources, in the form of grants, that agencies can draw from to address substantial increased demand.

In addition to the mitigation strategies proposed by the agencies, Metro will research mitigation strategies that other similar agencies have implemented. Metro is also coordinating across departments and has had initial discussions on potential strategies to improve parking. For example, to offset increased parking demand at the El Monte Transit Station, first/last-mile connections, additional bike lockers, etc. could be provided rather than building or reconstructing parking structures.

Metro is also coordinating with other ongoing internal programs with the Office of Extraordinary Innovation and the Vanpool and RideMatch programs to further inform strategies in the PIP. Currently, Metro is partnered with Via to offer on-demand rides to select transit stations weekdays from 6:00am to 8:00pm. Via matches passengers with other riders going their way to the same transit station and rides are shared, affordable, accessible, and on-demand.

Additionally, Metro is currently developing a MicroTransit Pilot Project. Unlike a traditional bus line, MicroTransit would follow turn-by-turn instructions from a navigation system that uses live traffic conditions and real-time requests for picks-ups/drops-offs. The service would be used for short trips (less than 20 minutes long) in defined service zones, and it would use vehicles that are smaller than traditional transit vehicles. Coordination with this project prior to implementation may be beneficial for the Pilot.

5.3.2 Key Stakeholder Findings/Recommendations

Each key stakeholder interviewed brought a unique perspective since they have all been engaged with the operation of the I-10 ExpressLanes, some since the beginning. As indicated in Table 7 and the previous sections, most of the stakeholders feel the ExpressLanes system is effective in reducing overall congestion and improving travel times on I-10. They acknowledged the ExpressLanes are more efficient than GP lanes, but they were concerned with the potential impacts to the GP lanes once this change in occupancy requirement goes into effect. They are concerned it will increase degradation and, in some cases, divert traffic onto local streets to avoid congestion on I-10.

A KPI mentioned frequently was person throughput and the concern that it has decreased since the 2016 conversion to a two-lane ExpressLanes facility. Carpools have decreased, while congestion and violators have increased. The ExpressLanes are susceptible to congestion due to enforcement challenges, especially during peak periods. Stakeholders suggested several potential mitigation strategies to address these concerns. Metro considered these suggestions and incorporated them into the PIP where feasible.

INTENTIONALLY LEFT BLANK

6 Preliminary Outreach

To better understand public perception of the Pilot, Metro conducted preliminary outreach efforts in the form of focus groups and field/electronic surveys to solicit feedback on the perceived benefits and impacts associated with HOV5+[6], especially to low-income commuters. Mitigation and incentivization strategies were discussed, and this helped inform strategy development covered in Section 7. This feedback also helped inform development of Metro's comprehensive outreach and education plan discussed in Section 8.

6.1 Focus Group Study

Metro conducted focus groups with community participants who commute as solo drivers, vehicle pools, or use transit on the I-10 corridor. The focus groups served to:

- Inform development of a subsequent effort to further engage Los Angeles County commuters through in-field and electronic surveys designed to expand outreach by gathering information pertaining to current travel behaviors.
- Gauge public reaction to future potential changes in minimum occupancy to travel toll-free on the I-10 Metro ExpressLanes.
- Test specific marketing messages to identify effective methods to communicate policy changes being explored through the I-10 ExpressLanes Pilot Program.

6.1.1 Methodology

The I-10 Pilot Focus Group Study consisted of nine qualitative focus groups consisting of commuters from Metro's database and of professionally recruited participants using specific screening criteria:

- Current ExpressLanes users:
  - Carpoolers with three or more people (low-income and non-low-income)
  - Solo drivers (low-income and non-low-income)
- GP lane users (low-income and non-low-income)
- Transit riders
- Vanpoolers
- College students

Participants consisted of individuals who were recruited and voluntarily opted to participate in the focus groups. A total of 88 participants were recruited with six to 13 participants per group. All interviews lasted 90 minutes. Following full participation in their assigned session, the agreed upon incentive was presented.

[6] At the time the focus groups were conducted, only the HOV5+ concept was tested.

MARKETING MESSAGING

To determine the marketing messages that would resonate most with people traveling in the I-10 corridor, focus groups participants were shown message boards that used different headlines to communicate the change in carpool requirements. Participants were asked to choose the top two preferred messages and explain why they chose them. Reactions to the marketing messages presented were consistent. This activity was followed by the moderator conducting a group discussion.

Message Boards

There were six message boards shared with every group in random order. Participants were asked to share their likes/dislikes/preferences for each messaging board by writing down their feedback and ranking the boards from 1-6. At the end, all participants chose their preferred headline(s) and/or subtext. They selected the words that resonated most with them to explain the HOV5+ change in occupancy (shown to the right). Each participant had the opportunity to create a new headline of their own choosing and was also invited to mix headlines and words to make the most effective communication that works for them.

Words that Resonated with Participants

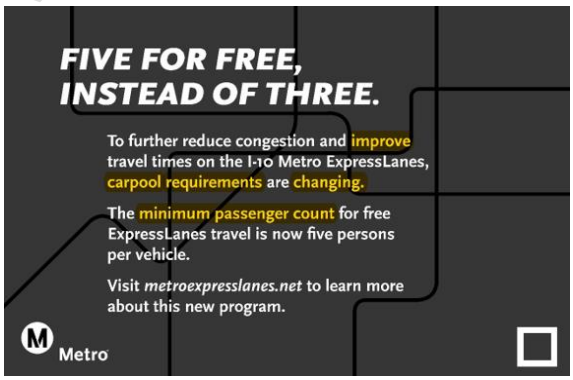
- **Carpool requirements**
- **Changing**
- **Policy**
- **Carpoolers**
- **Improve**
- **Minimum passenger count**
- **Free travel**

Two headlines were preferred among the six that were shown (Figure 12). Commuters liked them most because they were attention-getting and either intrigued them enough to ask questions or felt it provided enough information to convey the seriousness of a change that may impact their commute.

Preferred Headlines

- Carpool Requirements Are Changing on the I-10 Metro ExpressLanes
- Five for Free Instead of Three

Figure 12. Message Board Samples



The potential phasing should be *Carpool Requirements Are Changing on the I-10 Metro ExpressLanes* during pre-Pilot activities (eight months) and Phase 1 operations (14 months) and evaluation/Board decision (five months). During Phase 2 outreach (four months), the message would include both headlines. For Phase 2, only *Five for Free Instead of Three* would be used for operations (14 months) and evaluation/Board decision (five months).

Along with a discussion of the Message Headlines, the moderator facilitated a discussion surrounding participants' reactions to the use of a certain word or group of words. Feedback received was noted and preferences broken down into **Preferred** and **Less Desirable Word Descriptors** summarized in Table 10.

Table 10. Preferred and Less Desirable Word Descriptors

PREFERRED WORD DESCRIPTORS	LESS DESIRABLE WORD DESCRIPTORS
Policy	Rules
Change/changes/changing	Vanpool (too literal and exclusive, outdated, and something they would have no desire to even consider)
Carpool/vehicle pool (since a van is not necessarily required)	Fast/faster (because this is not guaranteed)
Requirements	More (because commuters don't get "more" of anything)
Free travel	Improve/improved (be careful the word does not make false promises)
For more information	Registered (vehicle registration or registered in a program?)
To create an account	
Improve/improved (commuters intrigued by something getting better)	

Overall, commuters wanted simple, straightforward language that helped them understand the change and the impact it would have on their commute. They were not interested in arbitrary language that involved guesswork. No one collection of subtexts was favored across all groups.

Media Messaging Preferences

Participants were asked about their attitudes and preferences for receiving media messaging in general and how they would want to receive transportation-related information from Metro. Their responses are captured in Table 11.

Table 11. Preferred Media Channels by Group

COMMON ACROSS ALL GROUPS	COLLEGE STUDENTS	OLDER PARTICIPANTS (MEN AND WOMEN 40+)
Text	Travel apps	Word of mouth
Email	Social media sites	Billboards
Direct mail	On-campus outreach	Community outreach
Public outreach materials and events	Transit applications	Employers
Highway messaging signs	Bus king ads	Websites
Billboards	Billboards	Local news
Radio	Radio	Radio

Source: *HOV5+ Commuter Focus Groups*

Most participants were interested in learning more about a Metro app that could be used for the HOV5+ vehicle pool program. Specifically, they wanted to know how Metro would keep track of actual occupants in the car, and how Metro would know who to charge and who should ride for free. Numerous participants favored an application tied into an existing third-party app to receive information from Metro, and to administer the HOV5+ program. They expressed "app fatigue" to some extent and suggested Metro partner with existing “go-to” applications for real-time traffic and commuting information such as Google Maps and Waze. They want interfaces to apps that are trusted and have functionality beyond what Metro may provide.

Traveling in the I-10 Corridor (as characterized by participants)

Most participants with experience driving or riding in the ExpressLanes understand its effectiveness as a convenient option that improves travel time and reliability. Concerns were expressed that the ExpressLanes were being utilized by occupancy misrepresenters or “cheaters” avoiding traffic in the GP lanes. Many said the I-10 ExpressLanes are as slow or slower than the GP lanes at times and are getting slower. They attributed these issues to too many cars in the ExpressLanes during peak periods and to the lack of effective enforcement.

Commuters described traffic/congestion as a culture they accept and endure as part of living in Los Angeles. They try to minimize the impacts of congestion on their commute by not traveling into the metro area, leaving their house early, or staying late at work to allow traffic to decrease. Others work from home, take mass transit, choose jobs close to home, or drive on side roads away from the interstate. Participants were asked to write down words they associated with travelling around Los Angeles, they included: burdensome, stressful, continuous, never-ending, ridiculous, a part of Los Angeles life, anger, and time consuming.

Carpooling

All participants were asked about their attitudes and behaviors regarding carpools. The response and interest in carpooling was greatest among those who currently or have previously participated in a carpool. They were motivated to participate in a carpool to save money, for social interaction, for ExpressLanes access, or because they do not have access to a vehicle.

Among those participants who do not currently participate in a carpool, several reasons were provided for why not, including but not limited to:

- Do not know others that are going to the same places.
- Schedule fluctuates.
- Prefer the freedom and flexibility of driving own vehicle.
- Do not want to ride with strangers.
- Do not know how to form a carpool.

It is important to note that low-income participant feedback did not vary uniquely from other participants interviewed on this topic.

The moderator described a potential change to carpool occupancy on the I-10 ExpressLanes. The description was presented as highly qualified and often repeated as “potential” or “hypothetical” or participants were asked to “imagine” if a change in requirements were a reality. Again, participants were told that this scenario was hypothetical and not a certainty. Participants were asked to share their thoughts and how the changes would impact them if the occupancy requirement for carpools was increased to five or more to ride toll free on the I-10 ExpressLanes.

The negative responses and concerns were most pronounced among existing carpoolers. Many felt as if something would be taken away from them after all the effort they had made to form/join a carpool. They did not understand why this change was needed and were quite vocal about the fact that legitimate carpools should not be punished, violators should be cited. Participants also expressed concern about the need for some mitigation or grace periods before penalizing legitimate carpools of three or more. One participant stated, "*Punishing the people who are playing by the rules instead of those making up their own rules is not fair, is not equitable, and is not right*."

The need for more enforcement was mentioned repeatedly.

The perceived challenges of forming a HOV5+ were consistent across groups. The negatives consistently outweighed the positives. Most of the concerns revolved around liability exposure and the inability to coordinate logistics for five or more passengers and still save time. For many, it came down to the risk and the reward. Many expressed concerns they may expose themselves to personal liability when driving others in a vehicle pool. The reward of a free toll by itself did not seem to be enough. Many people did not want to use their personal vehicle to drive others, and they did not like the idea of driving with strangers.

When participants were asked to imagine themselves creating a five or more-person vehicle pool to ride free in the I-10 ExpressLanes, they had many questions. Table 12 provides a summary of some of the key questions, expected benefits, and general concerns expressed during the focus groups, all of which served to inform development of the PIP, particularly the comprehensive outreach and education plan.

Table 12. Summary of Benefits, Key Questions, Challenges, and General Comments

GROUPING	SUMMATION AMONG ALL GROUPS
Benefit	With HOV5+ you can ride free in the ExpressLanes with people you know.
	More time spent with friends or associates.
	Helps preserve the environment.
Questions	Who would maintain the vehicle?
	Will there be a vanpool program that this all links to? Where is the support for this? What company is behind this vanpool program?
	How would you determine pick-up and drop-off locations?
	How does the insurance work? Who pays for the registration and insurance? What is the liability of the driver?
	How would you determine the routes?
	Who would assist in setting up the vanpool? Employer must get involved for it to work.
Challenges	Very difficult for those working for small companies to create a 5-person carpool.
	Must have the right type of vehicle to accommodate everyone with a seatbelt.
	Would need a second vehicle; do not want people in primary vehicle.
General Comments	Concerned overall commute time would increase due to the multiple stops and coordination for pick-up and drop-off.
	New change to five would require a lot of education and outreach to better understand the requirements.

Mitigation Strategies

During group discussions, the facilitator asked participants to imagine the requirements had changed and now they would have to pay a toll to drive in the ExpressLanes unless they formed vehicle pools of five or more people. Following the participants initial reactions and the subsequent discussion that ensued, they were asked to consider what could be done to mitigate the impacts of this hypothetical policy change. Responses are summarized in Table 13.

Table 13. Mitigation Strategies Suggested During the Focus Groups

SUMMARY OF PARTICIPANT SUGGESTED MITIGATION STRATEGIES
Get my employer involved to assist in identifying other vehicle poolers to reach 5+.
Ease into the 5+ requirement by grandfathering in those already in a registered carpool.
Consider a grace period for existing carpools.
Delay the occupancy requirement for existing registered carpools beyond the time horizon being considered for all other passenger cars.
Work with employers to develop alternative/flexible work schedules.
Work with employers to create virtual work programs.
Offer toll credits for a span of time for those who cannot immediately achieve 5+.
Improve enforcement – do something about the cheaters.
Create a depository where those wanting to form carpools can find carpoolers with similar routes/schedules.
Make participation in the program as easy as possible with no reporting requirements.
Offer incentives to participate (driver and rider incentives and rewards for keeping vehicle pools together).
Parking benefits/incentives.

Source: *HOV5+ Commuter Focus Groups*

Incentives to Form a HOV5+ Carpool

Participants were asked to share specific incentives that would encourage them to form a HOV5+ vehicle pool or at least explore it as a future possibility. Those who were more likely to engage in HOV5+ were existing carpoolers and those motivated by attractive incentives. The most attractive incentives were those related to driving/commuting. There were a significant number of participants who appeared to be unpersuaded under any circumstance regardless of the incentive to form or participate in a vehicle pool of five or more. These commuters were primarily solo drivers.

Responses from participants across all nine groups were similar and the words or statements concerning incentives for HOV5+ vehicle pool formation were captured in Table 14. College students who rode transit exclusively were asked to share what incentives might encourage them to pursue a HOV5+ vehicle pool. It is important to note that low-income participants did not vary uniquely from other participants we interviewed on this topic.

Table 14. Incentives Suggested During the Focus Groups

PARTICIPANT SUGGESTED INCENTIVES	
Tax breaks	Free or reduced parking on campus or at transit hubs
Gas cards	Discounts on fuel, maintenance, insurance, textbooks
Vehicle registration discounts	Receive toll credits for fulfilling minimum trip count thresholds in a vanpool program
Free insurance in case you are involved in an accident	Discounts from local merchants
Free or reduced parking	Frequent participation gets you gift card opportunities
New tires	Driver and rider tiered incentives; drivers would receive a greater incentive
Vehicle maintenance discounts	Employer sponsored ridesharing incentives
Cash awards the longer the vehicle pool stays together	Cash for the driver
Cash awards the more trips the vehicle pool takes together	Toll credits the more you carpool
Toll discounts when not driving as a vehicle pool	Merchant discounts

Source: *HOV5+ Commuter Focus Groups*

6.2 Corridor Survey

Metro conducted approximately 2,400 field and electronic surveys to understand commuters' perspectives on the potential increase to a HOV5+ occupancy requirement, to gauge the level of effort needed to encourage people to participate in the Pilot Program, and to assess potential impacts from a change in occupancy. The survey questions were informed by the focus group findings.

The survey targeted commuters who typically travel east to west during morning peak periods. The intent was to reach people from cities along the I-10 corridor from Fontana in San Bernardino County to Alameda Street in downtown Los Angeles. The surveys were conducted by using field intercepts (604 responses), which stationed teams that intercepted commuters at various locations over the course of a week, and online surveys (1,820 responses) placed on Facebook and Instagram.

The key objectives were to:

- Identify incentives that would encourage people to participate in a 5+ vehicle pool; and
- Identify mitigation strategies for anticipated impacts, such as 2+/3+ carpools would be ineligible to travel for free in the I-10 ExpressLanes.

6.2.1 Key Findings

The survey responses revealed that:

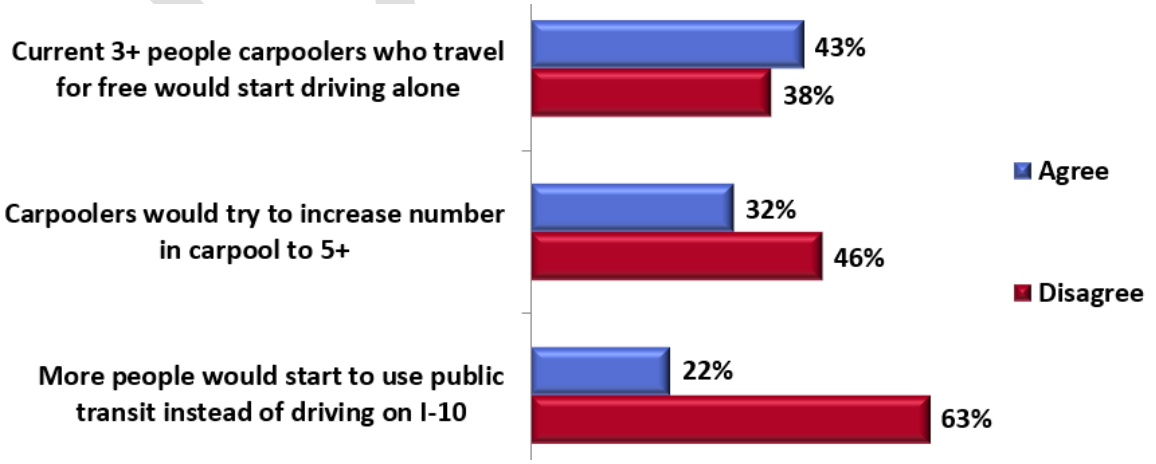
- Eighty percent (80%) of respondents travel on the I-10 regularly.
- Seventy-nine percent (79%) travel on the I-10 up to an hour in each direction.
- Seventy-one percent (71%) typically travel in their personal vehicle.
- Sixty-three percent (63%) travel 20 miles or less in each direction during weekday peak periods.
- Fifty percent (50%) were very familiar with the I-10 ExpressLanes.
- Thirty-four percent (34%) of respondents possess a FasTrak®.

There is a discrepancy between the percentage of people traveling on I-10 regularly (80%) and the familiarity with the ExpressLanes (50%). Survey responses demonstrated that only four out of ten participants showed a solid understanding of the ExpressLanes, which indicates the need for a vigorous outreach and education campaign that focuses on expanding awareness of the ExpressLanes and its benefits as well as the occupancy changes. Also, only one in three participants has a FasTrak® which is another opportunity to communicate why travellers would need a transponder to travel in the ExpressLanes, how easy it is to obtain, and communicate the benefits of the Metro Low-Income Assistance Plan, if needed.

Participants were asked what their primary mode of transportation was on the I-10 corridor. Seventy-one percent (**71%**) were SOVs, **19%** were 2-4-person carpools, **2%** were 5+ person car/van pools, and **5%** used transit. Participants also were asked if the occupancy increase would change how they travel on I-10. Of the participants that responded that it would affect their travel, **53%** would use their personal vehicle, **28%** would use a 2-4-person carpool, **8%** would either find a car/vanpool, and **8%** would take transit. This demonstrates that SOV use could decrease while vehicle pool and transit use could increase during the Pilot.

When participants were asked their thoughts on the reaction of current carpoolers if the minimum occupancy increased from 2+/3+ to 5+, the responses were mixed (Figure 13). However, most participants agreed that people would continue driving rather than utilize public transit. This scenario could be an opportunity for Metro and its partner transit agencies to examine why this is the public perception and to develop solutions to amerliorate it by offering faster, more reliable transit services during the Pilot.

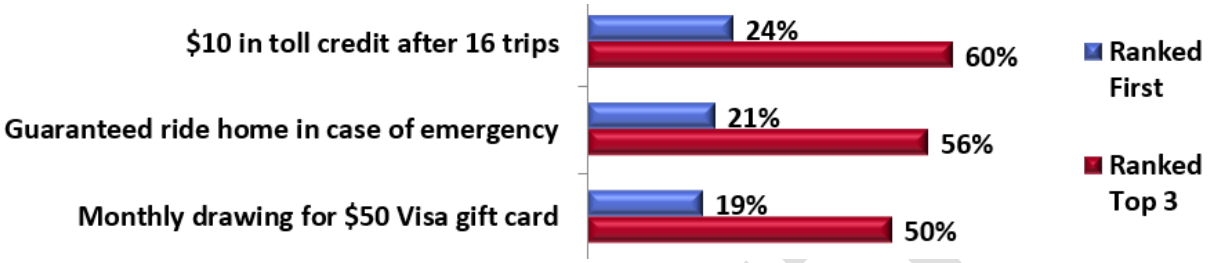
Figure 13. Participants Opinion on Current Carpoolers Travel Preferences if Occupancy Increased



MITIGATION AND INCENTIVIZATION STRATEGIES

Participants were asked to rank mitigation strategies that would help them maintain their current 2+/3+ vehicle pool without toll-free travel. Travel free during off-peak hours was ranked the highest (62%), which indicates that participants are interested in maintaining their current carpool.

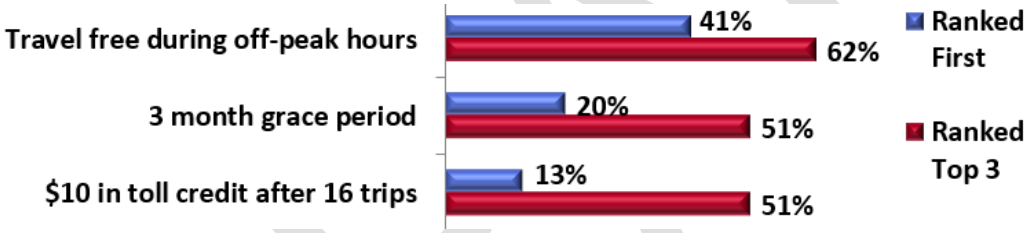
Figure 14. Top-ranked Mitigation Strategies to Maintain 2+/3+ Vehicle Pool



Also, participants suggested additional mitigation strategies to ease the transition, such as offering tiered tolling based on occupancy and establishing a voucher program.

Respondents were asked to rank a list of incentives that would help encourage formation of a 5+ vehicle pool. The most popular incentives were money-based options, which indicates respondents want something tangible in return for their efforts to form and maintain a 5+ vehicle pool.

Figure 15. Top-ranked Incentives to Form a 5+ Vehicle Pool



Participants also proposed other incentives such as toll credits, gas cards, rider support app, free tolls, and financial awards. The proposed mitigation and incentivization strategies that did not rank as high include: preferred parking for vehicle pools, discounted public transit fare, improvements to transit service, and discounted or free bike/scooter/rideshare to meet a vehicle pool.

6.3 Findings/Recommendations

Based on the focus group findings, Metro carefully considered public perceptions/attitudes and developed a phased approach to address concerns surrounding the challenge of forming a 5+ vehicle pool. By making Phase 1 transit only, it gives the public time to adjust to the increased occupancy requirements and form 5+ vehicle pools prior to Phase 2 implementation.

In addition, Metro will perform a post-implementation analysis for Phases 1 and 2 using both qualitative and quantitative surveys and focus groups to further inform program development. Further quantitative and qualitative study within both ExpressLanes user and non-user (GP) groups and/or the general public, particularly in communities along the I-10 corridor in both Los Angeles County and in adjacent San Bernardino County (communities where there is a reasonable expectation that current vehicle pools may originate) should be considered. Feedback from I-10 commuters may help identify which incentives are most likely to encourage continued participation in a program with increased minimum occupancy requirements, assist in mitigating impacts to current customers, and stimulate transit use as well as participation in vanpool and HOV5+ programs by making them more attractive.

INTENTIONALLY LEFT BLANK

7 Pilot Implementation Plan Support Strategies

Findings from the commuter surveys, focus groups, and partner agency/key stakeholder interviews helped inform the potential mitigation and incentivization strategies that could help address perceived equity concerns and lessen perceived impacts from the Pilot. They could encourage transit use as well as the formation of vanpools (Phase 1) and HOV5+ vehicle pools (Phase 2). These strategies would be supported by the comprehensive outreach and education plan in Section 8.

7.1 Current Complementary Programs

The Pilot will benefit from the continuance of Metro's current Low-Income Assistance Plan and Guaranteed Ride Home Program for vanpool participants. These programs will continue, and ongoing outreach and education will be provided as part of the Pilot.

The Low-Income Assistance Plan addresses potential equity concerns for 2+/3+ carpools that will have to pay tolls now. It provides a subsidy to qualifying individuals when opening a FasTrak® account, and it waives monthly account maintenance fees. Potential modifications to the Low-Income Assistance Plan were discussed, but since the Plan enables use of both Metro ExpressLanes programs, it was determined not to include any specific modifications to existing programs for the I-10 ExpressLanes as part of the PIP.

The Guaranteed Ride Home Program may encourage commuters to join a vanpool knowing that in an emergency they will be able to get home affordably.

Metro will continue current internal/external programs and relationships during the Pilot. This would include ongoing collaboration with Metro Transit and other transit partners, 511, and third-party traffic information providers (e.g., Waze) or similar programs and relationships.

7.1.1 Vanpool Program

Based on a review of other HOT/express lane facilities across the country that offer toll-free passage to vanpools, Metro staff found that most of the surveyed facilities had a minimum vanpool occupancy requirement of five passengers. As a result, Metro ExpressLanes staff is recommending toll-free travel to registered vanpools with five or more passengers in Phase 1 and to any vehicle that qualifies as a HOV5+ vehicle pool in Phase 2.

As of 2018, Metro's Vanpool Policy[7] allows for 55% occupancy attainment to maintain participation in the Metro Vanpool Program. There are vanpools operating on the I-10 corridor that on a day-to-day basis have occupancies that struggle to maintain minimum occupancies due to changes in work schedules, sick-outs, vacations, etc., making vanpools more vulnerable to changes in the occupancy policy. Metro vanpool staff recommends an early and ongoing outreach and education campaign to inform vanpool participants struggling to meet the minimum 5-person criteria that an I-10

[7] Metro defines vanpools as having five or more passengers.

ExpressLanes occupancy policy change is coming, outlining the requirements of toll-free travel under the proposed Pilot. The comprehensive outreach and education plan developed for the PIP took this into consideration and proposed a robust outreach campaign to current vanpool participants who consistently maintain 4-person occupancy levels.

They would have the following options with respect to participation:

1. Continue to operate with 4-person occupancy, be tolled for I-10 ExpressLanes travel, and share the toll with the other passengers;
2. Increase vehicle pool occupancy by at least one person to meet the 5+ passenger requirement for toll-free travel in the I-10 ExpressLanes; or
3. Choose to use only the GP lanes for travel if they do not meet the 5+ passenger requirement for toll-free travel.

Additionally, Metro staff found that most HOT/express lane vanpool programs they researched were registered through state agencies or metropolitan transportation organizations/regional commissions. Currently, southern California regional agencies have their own vanpool registration programs which could make tracking vanpools that are registered with other entities and traveling in the ExpressLanes difficult.

7.1.2 Transit Re-Investment Program

An opportunity exists to further develop the concept of a Transit Re-Investment Program to enhance existing transit operations. This could encourage commuters to use transit over vehicles, a goal of Metro's Congestion Reduction Program and this Pilot. As part of the Pilot's next steps, staff will collaborate with I-10 ExpressLanes transit operators (Metro and Foothill Transit) and continue to develop guidelines/criteria for participation in this potential subsidy program.

Examples of improvements this program could help transit operators achieve include:

- Improving customer experience since a mode shift is anticipated in Phase 1 and they want to retain the current transit ridership as well as grow it. Some examples of how to make a positive impact include:
  - Increase safety (e.g., security, lighting, etc.)
  - Enhance cleanliness (e.g., provide additional trash depositories)
  - Offer free rides on days that promote environmental awareness (e.g., Earth Day, Clean Air Day, etc.)
- Potentially funding operational improvements in Phase 2 (e.g., increase service frequency if Phase 1 successfully reduces congestion in the ExpressLanes).

7.2 Identification of Mitigation and Incentivization Strategies

Metro understands this change in toll-free vehicle occupancy policy will impact a portion of the current I-10 ExpressLanes users and that mitigation measures are needed to lessen the impacts to existing users. Metro identified a set of potential mitigation strategies that were informed, in part, by the survey and focus group findings. The purpose of mitigation strategies is to offset the real or perceived impacts of changing the toll-free occupancy requirement from 2+/3+ to buses and registered vanpools only in Phase 1 and adding HOV5+ in Phase 2. Several potential mitigation strategies were evaluated that ranged from expanding the existing 2+/3+ Carpool Loyalty Toll Credit

Drawing Program to providing an introductory grace period to ease the impact of changes to expanding the existing Transit Reward Program.

In the same manner, a set of potential incentive strategies were identified. Incentive strategies are designed to encourage the formation and use of 5+ vehicle pools and/or ride transit. Ideas included incentives such as removing pre-paid toll deposits and monthly account fees for dedicated 5+ FasTrak® accounts, offering parking benefits at Metro parking facilities, and establishing a Vehicle Pool Rewards program similar to the Transit Rewards Program.

7.3 Mitigation and Incentivization Strategy Evaluation

As potential mitigation and incentivization strategies were identified, a series of questions were developed to evaluate and rank them. Qualitative evaluation factors were established to score the strategies and are provided below.

1. Is this identified in the marketing survey report?
    - Acknowledgement of whether a strategy is similar to those identified in the survey. No points or Pass/Fail was attributed to this question
2. Is this similar to an existing strategy or program used by Metro?
    - Acknowledgment of whether a strategy either complements or is already being used. No points or Pass/Fail was attributed to this question. Strategies that align with the delivery timeframe of this Pilot receive a Pass; if not, they receive a Fail.
3. Can this strategy be implemented in a 6-month time frame?
    - Strategies that align with the delivery timeframe of this Pilot receive a Pass; if not, they receive a Fail.
4. Can this strategy be tied to the Pilot's goals?
    - Strategies that align with the Pilot Project's goals, such as those that support increased vehicle pools/person throughput and transit usage and decreased driving trips/vehicle miles traveled will receive higher points.
5. What is the level of cost to implement?
    - Strategies that are lower in cost to implement will receive higher points.
6. How easy would this be to implement?
    - Strategies that can be implemented internally are expected to deploy faster than those that would require external coordination/collaboration, therefore they received higher points.
7. What kind of External, Board, or Executive action would be needed to implement?
    - Strategies that will require higher levels of decision making will receive lower points, particularly where conflicting priorities would delay Pilot implementation.
8. What is the anticipated reach/acceptance with the community/participants?
    - Strategies that will provide higher levels of service to or potentially generate higher levels of support from a greater public audience will receive higher points.

Appendix D includes these descriptors and the range of input values used to score the eight factors for each of the strategies, it shows how the scoring levels are identified in the spreadsheet tool, and it provides the total weighted scores for the top-ranked strategies.

7.3.1 Mitigation and Incentivization Strategy Scoring

The next step was to use the spreadsheet tool to screen strategies for the highest scores. The total points each strategy received were calculated by summing the scores of all the evaluation questions. These scores were used to calculate the total points each strategy received and then rank ordered by the total number of points. The strategies that received the highest points received the highest ranking and were assumed to represent the most beneficial mitigation strategies. Table 15 provides the top-ranked mitigation strategies.

To implement effective change, mitigation and incentivization strategies were considered based on a combination of information provided by Metro marketing, outreach, partner agency and key stakeholder interviews, surveys, and focus groups. Suggested mitigation and incentivization strategies were evaluated against the goals of the Pilot, as well as the questions and qualitative criteria presented in this section. Many of the strategies did not rank high enough to be included in the PIP for further development. Depending on the strategy, it may have scored low for various reasons, such as high cost to implement, level of difficulty to implement, and anticipated reach/acceptance with the community/participants. Metro recognizes that for this PIP to be successful it is important to keep messaging simple rather than overcomplicate the program (e.g. varying business rules). This includes providing attractive and easily understood mitigation and incentivization strategies that will encourage travelers to participate in 5+ vehicle pools.

Table 15. Mitigation/Incentivization Strategies and Complementary Programs

TARGET AUDIENCE	STRATEGY TYPE	STRATEGY	PURPOSE/GOAL(S)	PHASE 1	PHASE 2
Current carpoolers	Mitigation	Continue existing **Carpool Loyalty Toll Credit Drawing Program.**	Continue to recognize/ reward lower-occupancy carpools by doubling the winners (20 – 40).	●	●
Current car/vanpoolers	Mitigation	Provide an **introductory grace period** of two months for existing car/vanpools (depending on peak period) where they can travel for free as they attempt to grow the number of occupants to five or more.	Address current carpooler concerns by giving them time to grow to 5+ vehicle pools by providing a grace period where existing carpools can continue to travel toll free while adjusting to the new rules.	●	●
Current carpoolers (also potential and/or existing transit riders)	Mitigation and Incentive	Develop a **Transit Re-Investment Program** that shares toll revenues with corridor transit agencies for operational and/or service enhancements along the I-10 EL.	Enhance transit operations along the I-10 EL to encourage transit use.	●	●

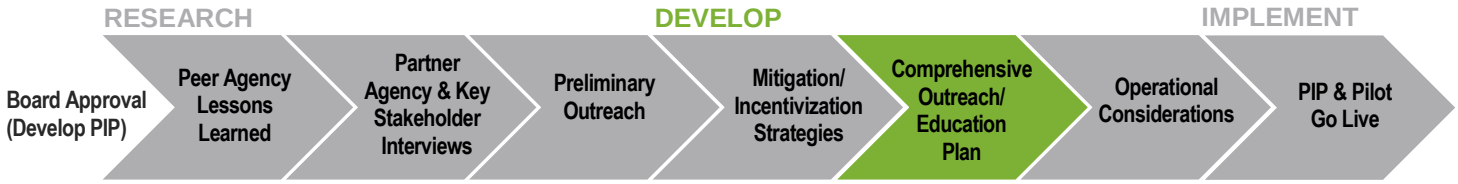
TARGET AUDIENCE	STRATEGY TYPE	STRATEGY	PURPOSE/GOAL(S)	PHASE 1	PHASE 2
Current carpoolers (potential transit riders)	Mitigation and Incentive	Expand existing **Transit Reward Program**.	Offset current carpoolers having to now pay tolls by lowering the threshold from 16 to 8 one-way trips for the Transit Rewards Program or earn toll credits when they use transit. Could also be an incentive to encourage transit use. Lower threshold would only be applicable to trips initiated on I-10 and not for those on other facilities.	●	●
College students	Mitigation and Incentive	Promote the **Universal College Student Transit Pass (U-Pass) program** at additional area colleges to expand participation.	Offer reduced fares to a greater number of college students to encourage transit use.	●	●
Potential 5+ carpools	Incentive	Develop a HOV5+ **Vehicle Pool Loyalty Toll Credit Drawing Program**.	Provide higher-level Toll Credit Rewards for 5+ vehicle pools to incentivize their formation.		●
		Establish a **Vehicle Pool Rewards** program similar to the Transit Rewards Program, except HOV5+ would receive a $15 toll credit after 16 one-way 5+ vehicle pool trips on I-10 EL during peak periods.	Vehicle Pool Rewards program would incentivize formation of 5+ vehicle pools. Toll credits could be used when not traveling as part of a 5+ vehicle pool.		●

7.4 Findings/Recommendations

The survey and focus group findings helped inform mitigation strategies for those most affected by the proposed policy changes, and incentivization strategies that would help encourage transit use, vanpool participation, and HOV5+ vehicle pool formation. Given the criteria, scoring, and weighting used, Metro will further develop and implement the highest-ranking potential mitigation strategies from each category for the Pilot. These strategies are expected to be easily implemented, cost-effective, and can support the Pilot within a 6-month timeframe.

INTENTIONALLY LEFT BLANK

8 Comprehensive Outreach and Education Plan



Metro recognizes the Pilot will impact individuals, communities, and stakeholders throughout Los Angeles County and regionally. Therefore, a comprehensive outreach and education plan will be needed that prioritizes outreach efforts to historically underserved and low-income populations, while ensuring all the appropriate stakeholder audiences are reached. Additionally, appropriate messaging will be designed in support of the unique changes in Phase 1 and Phase 2 of the PIP.

Metro ExpressLanes collaborated internally with Metro Marketing and Community Relations and the Vanpool Program to develop an outreach plan that was based on established plans and principles (discussed in Section 8.1) and informed by the survey/focus group findings and by the partner agency/key stakeholder interviews. This collaboration led to the development of an inclusive, equitable, and multi-lingual outreach and education plan. The tactics and activities described in this section were integrated into a comprehensive plan that carefully considered Phase 1 and Phase 2 implementation.

Phase 1 consists of a 14-month operational period (including a 2-month introductory grace period). Phase 1 is anticipated to begin in October 2020. Phase 2 outreach will commence after Phase 1 is complete, if the Board decides it is appropriate. Phase 2 outreach will last four months, and it will include ongoing data collection and analysis; comprehensive marketing, outreach, and education; and development and testing of the mobile app. Phase 2 operations are anticipated to begin in September 2022.

In addition, it is anticipated that a marketing outreach consultant will be procured to provide marketing/outreach services. This consultant would assist with the coordination of PIP activities and work in conjunction with Metro Marketing and Communications. The anticipated procurement will begin upon notice-to-proceed of the PIP and may be provided from the existing Metro Communications bench contract; procurement is anticipated to be complete within 90 days.

8.1 Outreach Plans and Principles

Metro's outreach strategy for the HOV5+ Pilot, is rooted in established Metro plans and principles, such as the *Vision 2028 Strategic Plan*, *Public Participation Plan*, and *Equity Platform*. A brief overview of each plan and how it was incorporated into the outreach plan is included below.

8.1.1 Vision 2028 Strategic Plan

Metro's *Vision 2028 Strategic Plan* (Vision 2028) seeks to improve upon and provide enhanced mobility options to everyone regardless of transportation mode. Vision 2028 set Metro's strategic direction and served as the foundation for the PIP. To further advance and align with Vision 2028, the PIP incorporated the plan's goals to:

- Provide high-quality mobility options;
- Deliver superior trip experiences for all users;
- Enhance communities and quality of life through mobility and access to opportunities;

- Transform Los Angeles County through local/regional collaboration and leadership; and
- Provide responsive, accountable, and trustworthy leadership within the Metro organization.

8.1.2 Public Participation Plan

Metro's *Public Participation Plan*[8] will guide all outreach efforts to gather important public input on possible changes to ExpressLanes policy. A comprehensive, equitable, and sustained public participation program that bridges connections with communities and individuals who have deep relationships and insights into community-specific needs and opportunities will be essential to the Pilot's success. The plan's goals and guiding principles were integrated into the PIP:

- Develop robust and inclusive public engagement programs;
- Sustain and strengthen relationships with local and regional stakeholders;
- Prioritize outreach to non/limited English proficiency speakers and low-income communities;
- Provide access to information through various multi-lingual resources;
- Implement innovative outreach methods that encourage meaningful participation;
- Explore unconventional, but effective approaches to increase awareness and understanding; and
- Deliver outreach tactics and public education methods in an equitable manner.

8.1.3 Equity Platform

Metro will develop a multi-point equity platform[9] framework for the Pilot to address and overcome transportation-focused disparities faced by non/limited English proficiency, low-income, and other historically underserved communities. Metro's equity platform will help it:

- Provide access to opportunities that involve public decision-making, investment, and service;
- Seek out and involve the diverse range of voices that should be collaborating on the Pilot;
- Establish multiple forums to engage the community meaningfully and actively; and
- Improve relationships and partnerships with community-based organizations, cities, and other local government agencies to better engage historically underserved communities.

8.2 Outreach Strategy

Metro developed a comprehensive stakeholder outreach and community relations strategy based on the plans and principles described in Section 8.1. The strategy's implementation will ensure key stakeholders are engaged in the Pilot's education campaign during each phase. Metro will leverage existing relationships and identify opportunities for engaging new stakeholders.

Peer agencies Metro interviewed expressed that local government support and concise public communications were key to stakeholder and community acceptance of the project. The vocal support of local policymakers made the project more palatable to their constituents, and clear

[8] The Public Participation Plan meets and exceeds FTA, FHWA, and Title VI requirements for environmental justice, limited English proficiency, and non-discriminatory regulations.

[9] Metro's multi-point equity platform is built around four pillars: 1) define and measure; 2) listen and learn; 3) focus and deliver; and 4) train and grow. (Metro Equity Platform Framework PowerPoint presentation - Executive Management Committee, February 15, 2018, slide 4)

communications on the benefits to both transit-and non-transit users helped gain additional public acceptance.

8.2.1 Key Stakeholder Partnerships

In addition to the individuals and communities that may be impacted throughout Los Angeles County, Metro will connect with existing partners within key stakeholder groups in the San Gabriel Valley (SGV). It will seek opportunities to make presentations and to encourage these groups to share information with their networks. These networks include but are not limited to:

- **Metro Advisory Groups:** SGV Service Council, Community Advisory Council, Policy Working Group, On the Move Riders Clubs, and Faith Community Roundtables.
- **San Gabriel Valley Cities:** San Gabriel Council of Governments (SGVCOG) cities.
- **Business Organizations:** SGV Economic Partnership, chambers of commerce, and industry councils.
- **Civic Organizations:** SGV Public Affairs Network, SGV Civic Alliance, Asian Pacific Islander Forward Movement, etc.
- **Social Organizations/Clubs:** Rotary Club, Kiwanis Club, Soroptimist International, Partisan Social Club, etc.
- **Educational Institutions:** Rio Hondo College, East Los Angeles College, University of the West, Mt. San Antonio College, California Polytechnical - Pomona, Pasadena City College, California Institute of Technology, Claremont colleges, University of La Verne, school districts, etc.
- **Transit Agencies:** Foothill Transit, Metrolink, Access Services, and other municipal bus operators.
- **Community-Based Organizations:** DayOne, Active SGV, Asian Youth Center, etc. (Low-income, limited English proficiency, and/or minority population organizations will be prioritized. Outreach will highlight the FasTrak® Low-Income Assistance Plan.)

Additionally, Metro will engage new stakeholders to share information about the HOV5+ Pilot via community events; key transit center outreach (e.g., Metro, Foothill, and Metrolink stations); and collateral materials distributed online, in-person, and mailed (as appropriate).

Table 16 is an overview of Metro's key stakeholder engagement strategy.

Table 16. Outreach and Community Relations Engagement Strategy

	ENGAGEMENT STRATEGY								
	Metro Advisory Groups	SGV Cities	Business Organizations	Civic Organizations	Social Organizations/ Clubs	Educational Institutions	Transit Agencies	Community-based Organizations	Community Events
Partner/ Sponsor	Metro	Metro/SGVCOG	Metro	Metro	Metro	Metro	Metro/Transit Partners	Metro	Metro
Target Audience	Metro stakeholders	SGV municipalities and elected officials	Business stakeholders	Diverse populations of all demographics	Diverse populations of all demographics	Students	Transit Riders	Low-income, hard to reach audiences	Diverse populations of all demographics
Timing	**Continuous**								
Location & Reach	Greater LA	SGV	SGV	SGV/Greater LA	SGV/Greater LA	SGV/Greater LA	SGV/Greater LA	SGV/Greater LA	SGV/Greater LA
Network Maximization	Feedback on Pilot Program	Feedback on Pilot Program; Shared information on city channels	Expanded reach from transportation management organizations and groups via websites and/or newsletters	Expanded reach from groups via their websites and/or newsletters	Expanded reach from groups via their websites and/or newsletters	Expanded reach to students via institution's websites and/or newsletters	Expanded reach from municipalities via their websites, newsletters, and other outlets	Expanded reach from groups via their websites and/or newsletters	Connect with a minimum number of stakeholders at each event (predetermined prior to event)

8.3 Marketing Plan

The overall objective of the marketing plan is to support the growth and optimization of the ExpressLanes.

The Outreach and Education Marketing Strategies are intended to provide cost estimations/projections for the implementation of robust marketing plans for Phase 1 and Phase 2 and may not represent total final expenditures. Depending on Pilot impacts to managing congestion in the ExpressLanes and other operational considerations, Phase 3 could transition the Pilot to permanent operations or revert to the original Metro ExpressLanes policy. An outreach/education program would be developed to properly notify the public of any changes. Metro Marketing will work with the ExpressLanes team and media buyer to develop media content from the public sphere. The marketing tactics in the Pilot Marketing Plan would be used to mitigate public confusion and concerns and educate the traveling public on the proper use of the I-10 ExpressLanes.

Table 17. Pilot Marketing Plan

TARGET AUDIENCE: Current ExpressLanes Users

	AUDIENCE	OBJECTIVE	TACTICS	CREATIVE CONCEPT(S)
Phase 1	• ExpressLanes (EL) customers; • EL 3+ users; and • Low-income customers.	• Educate current EL I-10 customers; • Encourage transit use; and • Mitigate unfavorable reactions of existing HOV users to policy change.	• Email-blast (e-blast) header and promo box (used by EL); • Website update; • Direct mail (30k mailers); • Surveys; and • Source post and earned media PR.	• Design and messaging concepts are under development. • Highlight incentives and benefits for mitigation and conversion.
Phase 2	Same as Phase 1	• Educate current EL I-10 customers; and • Mitigate unfavorable reactions to HOV5+ Pilot/policy change.	• Same as Phase 1 plus a general education video.	Same as Phase 1 plus potential mitigation/incentivization strategies: • Carpool Loyalty Toll Credit Drawing Program; • Introductory 2-month grace period; • Transit Re-investment Program; • Transit Reward Program; • Universal College Student Transit Pass (U-Pass) program; • Vehicle Pool Loyalty Toll Credit Drawing Program; and • Vehicle Pool Rewards Program.

TARGET AUDIENCE: I-10 Corridor Vanpool/Carpool Drivers

	AUDIENCE	OBJECTIVE	TACTICS	CREATIVE CONCEPT(S)
Phase 1	• Vanpool/carpool participants along the I-10 corridor.	• Educate and inform vanpool and carpool participants who travel along I-10 about the Pilot. • Encourage transit use. • Conduct an education and outreach campaign to inform and/or encourage registered vanpool program participation.	• E-blast header and promo box (used by CTOC and employer); • Insert for Vanpool Program newsletter; and • Website update.	• Design and messaging concepts are under development. • Highlight incentives and benefits for mitigation and conversion. – Carpool Loyalty Toll Credit Drawing Program; – Introductory 2-month grace period; – Transit Re-investment Program; – Transit Reward Program; and – Universal College Student Transit Pass (U-Pass) program.
Phase 2	• Same as Phase 1	• Conduct an education and outreach campaign to inform and/or encourage HOV5+ vehicle pool formation/participation.	• Same as Phase 1 plus: – Lobby poster for employers to display; – Tail and king ads on buses (Silver Line) and trains; – Paid media buy with civilian gas-pump and parking lot ads; and – Earned media via PR.	• Same as Phase 1 plus potential mitigation/ incentivization strategies: – Vehicle Pool Loyalty Toll Credit Drawing Program; and – Vehicle Pool Rewards Program.

TARGET AUDIENCE: GP Lane Drivers + Employers/Employees in I-10 Corridor

	AUDIENCE	OBJECTIVE	TACTICS	CREATIVE CONCEPT(S)
Phase 1	• General audience (GP lane drivers) of I-10 drivers; • Employers/ employees in mid- to large-size businesses; and • Low-income drivers along I-10.	• Launch an education campaign to inform general I-10 drivers and employers/ employees who work in mid- to large-size businesses along I-10 about the policy change. • Encourage transit use.	• E-blasts for businesses; • Lobby poster for area businesses; • Website update; • Civilian paid media buy (Beacon office building digital ads/geofencing, parking lot ads, SEO, WAZE, native ads, billboards, gas pumps ads, radio); • Social media ads; and • Earned media via PR.	• Design and messaging concepts are under development. • Highlight incentives and benefits for mitigation and conversion: – Carpool Loyalty Toll Credit Drawing Program; – Introductory 2-month grace period; – Transit Re-investment Program; – Transit Reward Program; and – Universal College Student Transit Pass (U-Pass) program. • Get word out.
Phase 2	• Same as Phase 1	• Same as Phase 1	• Same as Phase 1	• Same as Phase 1 plus potential mitigation/ incentivization strategies: – Vehicle Pool Loyalty Toll Credit Drawing Program; and – Vehicle Pool Rewards Program.

If the I-10 HOV5+ Pilot does not become a permanent business rule in either Phase 1 or Phase 2, an outreach/education program would be developed to properly notify the public of the changes.

Also, in the event the Metro ExpressLanes Pilot is canceled in either Phase 1 or Phase 2, Metro Marketing will work with the ExpressLanes team and media buyer to remove media content from the public sphere. All content that cannot be pulled would either mention the Pilot's cancellation or it would push out a general ExpressLanes message. The marketing tactics in the above plan would be used to mitigate public confusion and concerns.

8.3.1 Media Buy Strategy

Metro will use a professional media buyer and will place all advertisements. The media buy will focus on:

- Radio (terrestrial and digital);
- Social media;
- Digital display banners;
- Out-of-home/billboards; and
- Local newspapers along the I-10 corridor where people live, work, and play.

It is important to note that any media buy Metro considers would be dependent on its cost-effectiveness, location, and availability.

Diversity Targeting

Metro can increase its chances of engaging and communicating with its diverse target audiences by delivering hyper-targeted impressions among several demographically honed channels.

Radio Station Buy Strategy

Radio is the most efficient channel for traditional mass media outlets, especially in reaching hard-to-reach/historically underserved communities. Various radio outlets should be selected that reach the project's adult demographic (ages 25-54) with various backgrounds including non-English speaking radio stations. When buying ads, Metro will select stations that provide “bonus” spots to maximize the campaign budget. The anticipated timing for the campaign will be every other week for six weeks for longevity. Metro will air more ad spots on nights and weekends to reach listeners during largely non-working hours.

Digital Media Buy Strategy

A digital and social media messaging campaign will be launched that will target audiences by ethnicity, age, household income, and lifestyle/culture. Digital forms of media with consistent themes and branding are the most efficient impressions to reach Metro's target audience with minimal wasted impressions.

Suggested digital platforms and targeting include:

- AdWords/keyword campaign
- Search retargeting
- Content-based training
- Cross-device behavior targeting
- Cross-device retargeting
- Geo-fenced location
- Digital programmatic radio
- Localized digital banners

Traditional Media Buy Strategy

This allows Metro to conservatively leverage traditional media outlets to greatly increase its campaign reach. It is not as targeted as digital media, but it will be highly visible/seen by a larger audience. Media buys will be focused primarily on media outlets within the I-10 corridor and focus on reaching SGV residents.

Out-of-Home/Billboards

Out-of-Home messaging will occur in areas where culturally diverse populations predominately reside. Messaging and imagery would be updated to connect appropriately with each group. Additionally, Metro will purchase digital and static billboard space along the I-10 corridor to target commuters while in their vehicles.

Paid Social Media Buy Strategy

Facebook

Metro will use dark posts (unpublished posts that exist as ads) to reach a broader audience that fits the target market to help spread awareness.

Instagram

Metro will leverage video posts to capture attention, engage, entertain, and educate about the new changes.

Twitter

Commuters on Twitter have captive audiences that love complaining about traffic. Metro could target hashtags that commuters frequent like #LAtraffic.

Table 18. Pre-Pilot and Pilot Outreach Timelines

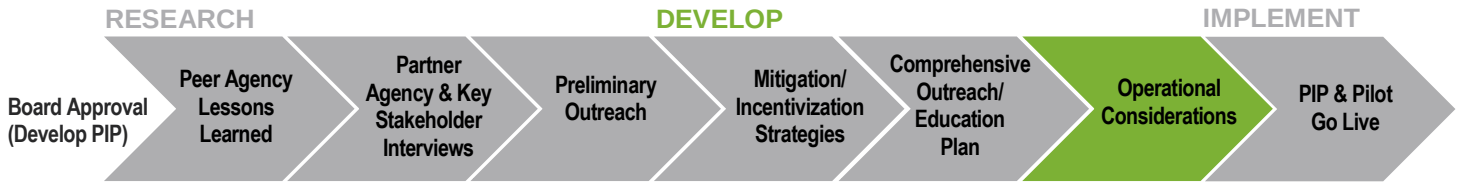
PRE-PILOT OUTREACH	PHASE 1	PHASE 2	PILOT OUTREACH	PHASE 1	PHASE 2
Direct Mail	●	●	Social media ads/ Facebook retargeting	●	●
Newsletters/e-blasts	●	●	Civilian paid media buy continued	●	●
Website updates	●	●	Ongoing surveys	●	●
Tail and king ads on buses and trains	●	●	Focus groups	●	●
Source post and earned media PR	●	●	Civilian paid media buy continued	●	●
Civilian paid media buy (Beacon office building digital ads/geofencing, parking lot ads, SEO, WAZE, native ads, billboards, gas pumps ads, radio)	●	●	Tail and king ads on Silver Line buses and trains		●
Lobby posters for area businesses		●			

8.4 Findings/Recommendations

To meet the multi-faceted needs of Los Angeles County commuters, successful implementation of the Pilot will require a comprehensive outreach and education plan with early and ongoing public education and outreach efforts, identification of any barriers to participation, and consideration of mitigation and incentivization strategies to offset impacts, particularly to low-income commuters and HOV2+/3+ carpoolers. A comprehensive outreach and education program will be developed for each phase to ensure the public understands the who, what, when, where, why, and how with respect to the proposed policy changes for the I-10 ExpressLanes.

Additionally, Metro and Metro Marketing will continue collaborating on the development of a robust outreach and education program that appropriately conveys the need for and benefits of transit use, vanpools, and HOV5+. It will be designed to reach various audiences and through multiple means, as identified during focus group outreach efforts. This could include radio ads, billboards along the impacted corridor, email notifications to current customers, ads via social media, through other existing mobile apps visited frequently by commuters for transportation-related information, local newspapers, and direct mail-outs. Ongoing public engagement throughout the Pilot is recommended.

9 Operational Considerations



There are several operational considerations that Metro examined to help the Pilot be successful. These activities are discussed throughout the PIP, and they will need to be completed prior to Go Live.

- Implement a phased approach for the required signage changes to reflect the new toll-free travel requirements of buses and vanpools only (Phase 1) and HOV5+ (Phase 2).
- Develop pre- and post-change data needs and establish a baseline data and collection plan to assess the impacts for each phase of the Pilot.
- Procure and implement an occupancy declaration/verification mobile app.
- Assess and implement needed modifications to BOS and CSC technology.
- Train CHP enforcement officers, ExpressLanes customer service representatives, and other Metro staff for the Pilot.

Some of these activities are already being advanced. For example, Metro has been coordinating with Caltrans and FHWA regarding signage changes and evaluation data needs. Preparations are underway within Metro for the mobile app procurement and to address potential CSC technology needs. Training is included in the Implementation Roadmap (Appendix B).

This section focuses on the existing ExpressLanes toll signs and presents proposed updates that will be required to implement a phased approach that includes transit only (Phase 1) and HOV5+ (Phase 2) on the highway system and the mobile app.

The concepts presented herein have been developed independent of Metro's "Pay As You Go" Pilot. While the concepts presented below do not conflict with the sign modifications recommended for the "Pay As You Go" Pilot messaging, Metro will continue to coordinate closely with the FHWA and Caltrans to integrate a comprehensive signage strategy for the needed sign modifications for these two independent pilot programs prior to implementing any signage changes.

9.1 Existing Toll Signage

The existing signage along the I-10 ExpressLanes (shown in Figure 10) that displays HOV occupancy requirements is identified as MUTCD R3-11(CA)(Mod). Additionally, there is signage stating HOVs are required to carry the FasTrak® transponder (although all ExpressLanes travelers are required to carry the transponder as of this time). The R3-11(CA)(Mod) regulatory signs are generally located on posts in the median in advance of ExpressLanes access points. "All HOV Must Have FasTrak®" requirement signs are mounted on some of the dynamic message signs (DMS) along the corridor.

9.2 HOV Occupancy Signage Modifications

This section discusses the proposed phased approach to sign messaging and our review of standards and guidance provided by the California Manual on Uniform Traffic Control Devices (MUTCD).

9.2.1 Proposed Sign Messaging

All existing toll signs that provide the HOV3+/HOV2+ (R3-11[CA][Mod]) will be replaced for Phase 1 to communicate that buses and registered vanpools travel toll free, while all others (SOV, HOV2+, and HOV3+) will be charged a toll. For Phase 2, occupancy requirements will extend to include HOV5+ vehicles for toll-free travel. For Phase 2, HOV5+ vehicles that wish to travel toll free will be required to use a FasTrak® transponder and a mobile app to declare vehicle occupancy.

Figure 16 shows the recommended replacement signs for the existing R3-11(CA)(Mod) signs that are located prior to each ExpressLanes access point. The replacement signs will be approximately the same size as or smaller than the existing signs. In Phase 1, the existing R3-11(CA)(Mod) signs will be replaced by the proposed R3-40(Mod1) signs that state buses and vanpools travel toll free. In Phase 2, they will be replaced by R3-40(Mod2) signs that define HOV 5+.

Some current R3-11(CA)(Mod) locations have sign panels missing, so additional signs would be added to the corridor to further communicate the HOV5+ requirements necessary for a toll-free ride. Also, it is proposed the applicable hours of the HOV5+ toll-free travel requirement would be 24 hours a day, seven days a week. Additional signage will be needed to convey the need to pre-register at Metro's website. As part of the registration, the driver would be directed to an app store (Apple or Google Play) to download the appropriate app. The proposed signs will have to support the new mobile app and clearly communicate a complex message.

Figure 16. HOV Occupancy Requirement Signs (Existing and Proposed for Phases 1 and 2)

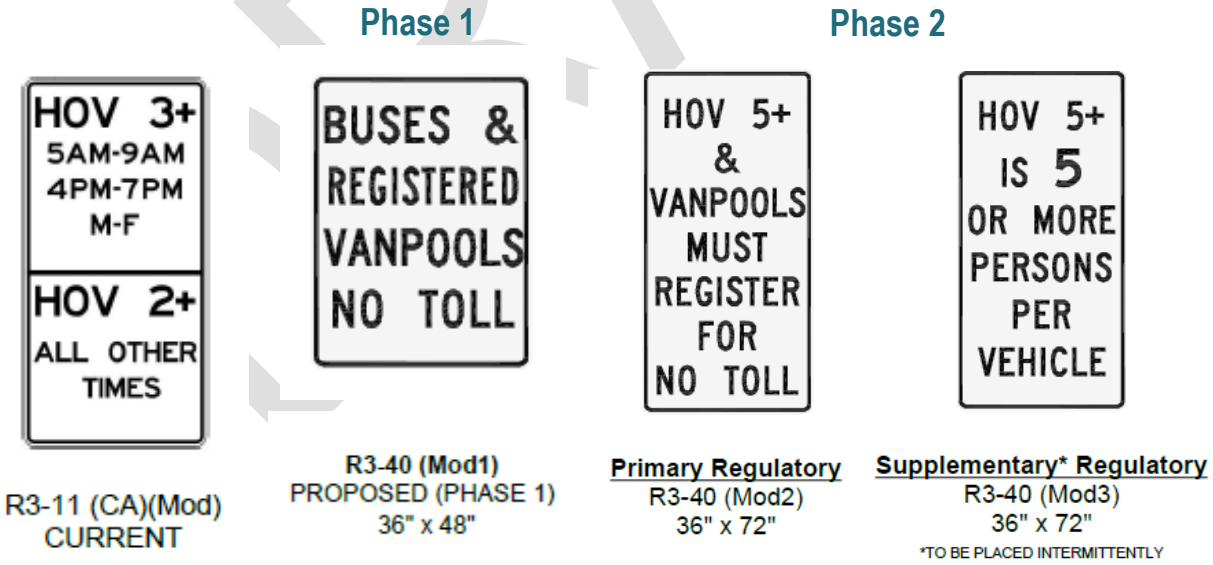


Figure 17 depicts potential supplemental sign modifications for Phase 1 and 2 occupancy requirements. In Phase 1, the SG-49A(CA)(Mod) sign panel directs vanpools to call 511 for discount information, which would then direct them to access Metro's website where additional information on toll-free travel would be provided about the program and registration for it. In Phase 2, a HOV5+ overlay will be added to the sign.

This sign panel is similar to the SG-49A(CA) sign (Call 511 for Travel Info) but in Phase 1 revises the information to inform those satisfying occupancy requirements that they are eligible for a discount. The SG-49A(CA)(Mod1) sign panel will be placed throughout the corridor, mainly on the DMS vertical post (Figure 19). In Phase 2, a HOV5+ overlay will be added to the sign. Close and ongoing coordination with Caltrans and FHWA will determine the final messaging on all proposed signs.

Figure 17. Occupancy Requirement Signs (Phases 1 and 2)

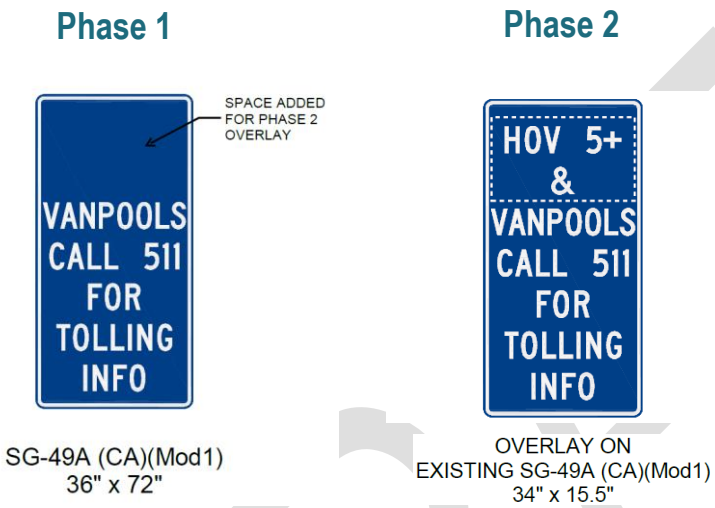


Figure 18 provides a schematic layout of the limits of this Pilot (I-10 between Union Station and I-605). Intermediate ingress-egress locations are shown as orange bars. The layout depicts the approximate location of each sign placement.

Figure 18. Schematic Layout of Sign Placement

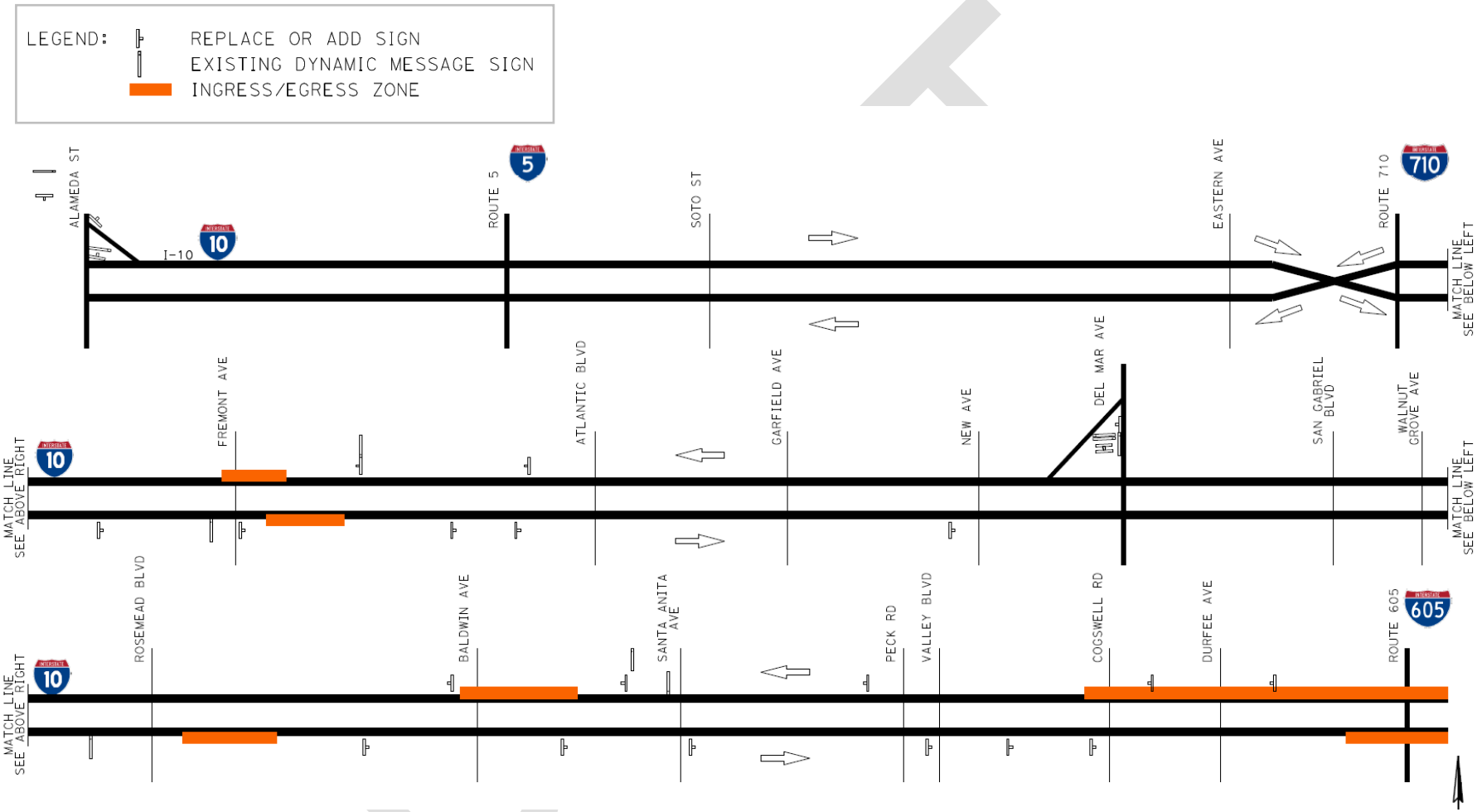


Figure 19 depicts a typical elevation view at the DMS location. The “All HOV Must Have FasTrak®” sign panel can be removed because it is not applicable since all vehicles must have the FasTrak® transponder to use the I-10 ExpressLanes. In the future, with the implementation of the "Pay As You Go" Pilot program, vehicles will no longer need a transponder. To minimize driver confusion, removing the “All HOV Must Have FasTrak®” sign panel is recommended.

For Phase 1, the R3-40(Mod1) sign panel can be added at this location. The existing HOV2+/3+ DMS messaging will need to be modified to specify buses and registered vanpools are the only vehicles that travel toll free. For Phase 2, HOV5+ will be added to the sign as a reflective overlay, and the DMS messaging will need to be modified to specify the HOV5+ requirement or do not use any HOV wording. The exact wording for the DMS has not been determined at this time and any changes will require ongoing coordination with Caltrans before displaying.

Figure 19. DMS with Modified Message and Static Sign Replacement (Existing and Proposed – Phase 1 and 2)

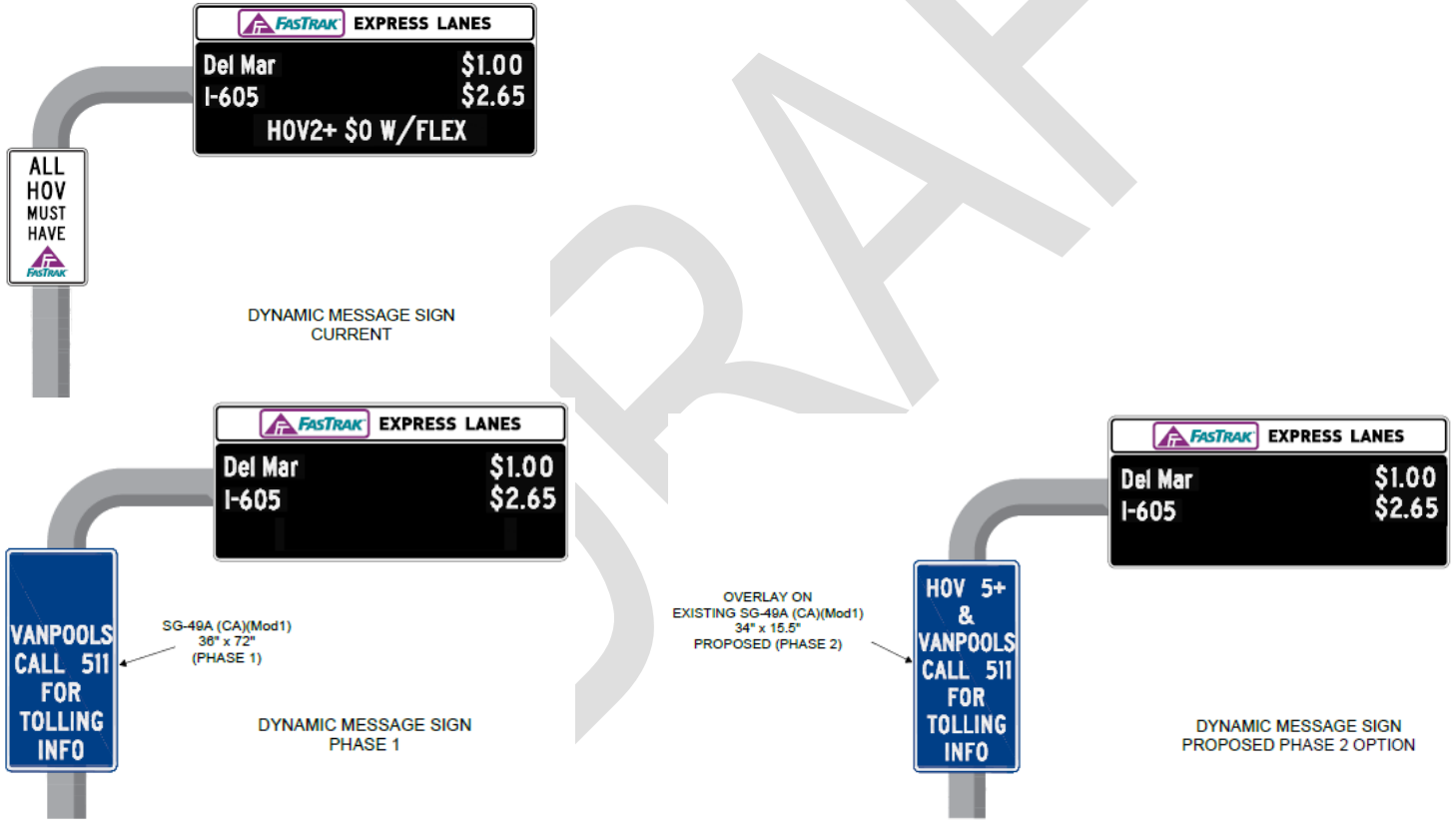


Table 19. Sign Modifications Summary

EXISTING SIGN	EXISTING MESSAGE	NEW SIGN	NEW MESSAGE	PH1	PH2	QUANTITY NEEDED	REPLACE EXISTING?
R3-11(CA)(Mod)	HOV 3+/2+ (days/hours)	**R3-40 (Mod1)**	**Buses & Registered Vanpools No Toll**	●		**24**	Yes
R-3(Mod)	All HOV Must Have FasTrak®	**SG-49A (CA)(Mod1)**	**Vanpools Call 511 For Tolling Info**	●		**10**	Yes
R3-40(Mod1)	Buses/ Vanpools No Toll	**R3-40 (Mod2)**	**HOV5+ is 5 or More Persons per Vehicle**		●	**24**	Yes
SG-49A (CA)(Mod1)	Vanpools Call 511 For Discount Info	**SG-49A (CA)(Mod1)**	**HOV 5+ & Vanpools Call 511 For Tolling Info**		●	**10**	Yes
DMS bottom (third) line	HOV2+ $0 W/FLEX	**N/A**	**(Blank) or TBD message**	●	●	**10**	N/A

9.2.2 CA MUTCD and Caltrans Standard Plan

The CA MUTCD provides uniform standards and specifications for all official traffic control devices in California, including Preferential Lane (HOV) signage. HOV signage standards, guidance, and options are detailed in CA MUTCD Chapter 2G, "Preferential and Managed Lane Signs."

9.2.3 CA MUTCD Reference Standards and Basis of Design

Section 2G.16 Signs for Priced Managed Lanes - General, para. 01 states: "*A priced managed lane might allow non-toll travel by certain vehicles based on occupancy or other criteria. A variety of operational management strategies might be used in conjunction with tolling or pricing.*" For the purposes of this PIP, the vehicle occupancy requirement is five or more (5+) to use the I-10 ExpressLanes with a FasTrak® transponder and mobile app.

Para. 02 states: "*The number and combination of operational strategies that are applied to a managed lane to manage congestion or improve efficiency might be practically limited by the amount of information that can be legibly displayed on signs or in signing sequences and still be readily comprehended by road users. Such factors to consider when evaluating alternatives for managed lanes are locations of signs for general-purpose interchanges and for other roadway conditions, the number of intermediate access points between the managed and general-purpose lanes and the need to repeat the operational information, and the distance over which a signing sequence that displays all of the eligibility requirements can be displayed.*" Since the placement of signs is dependent on ExpressLanes access points, the replacement signs will be placed in the same location as the existing ones. Additionally, signs may be added throughout the corridor for clarity. There is no specific uniform spacing of these signs.

SIGNAGE REPLACEMENT DURING THE PILOT

The modifications require the replacement of the existing regulatory sign panels with new panels along this corridor. The existing signs are to be salvaged and stored in a specified location. Upon completion of the evaluation period of the Pilot, the salvaged signs may be reinstalled at their previous locations. If the pilot is successful and becomes permanent, the salvaged signs should be discarded appropriately. Metro will pursue opportunities to minimize costs and meet the expedited timeline for installation. An opportunity exists where the signs can be replaced by Caltrans Maintenance instead of an independent contractor.

CALTRANS STANDARD PLAN REFERENCE FOR PAVEMENT DELINEATION

There is no specific pavement delineation (striping and marking) standard (Caltrans or MUTCD) specific to the HOV2+/HOV3+ changes to buses/vanpools and eventually HOV5+ travel toll-free. Thus, no pavement delineation changes will be needed for this Pilot.

CALTRANS SYSTEM SAFETY GUIDANCE

The placement of some of the sign panels will be located on the existing concrete barrier (Type 50 or "Jersey Barrier") and current standards state the concrete barrier must be upgraded with a 48-inch high barrier and the straddle bracket mounted on the concrete barrier will no longer be used. Understanding this is a short-term pilot program, the cost to replace each section of barrier where a replacement sign is proposed would increase the construction cost of the Pilot threefold. As a result of and due to the Pilot status of this effort, implementation will not update existing barriers.

9.3 Roles/Responsibilities and Implementation Schedule

Metro obtained Caltrans' concurrence and is currently seeking FHWA's on roles, responsibilities, and the implementation schedule. A draft roles and responsibilities matrix and a high-level implementation timeline are included as Table 20 and Table 21.

Table 20. Signage Updates - Roles and Responsibilities

ACTIVITY	RESPONSIBLE AGENCY/PARTY
• DMS Messaging Revisions • Prepare Plans • Construction Support	**Metro ExpressLanes**
• Plan Approval	**Caltrans and FHWA**
• Sign Panels Procurement and Installation	**Caltrans**
• Construction Oversight	**Caltrans**

Table 21. Signage Updates - Implementation Schedule (both phases)

ACTIVITY	ESTIMATED DURATION
Sign Plan Design and Caltrans and FHWA Concurrence	45 days (pre-Pilot activities)
Coordinate and Schedule Fabrication	60 days (pre-Pilot activities)
Sign Fabrication	180 days (Pilot activities)
Sign Installation	60 days (Pilot activities)
TOTAL	**240 days (8 months)**

9.4 HOV5+ Mobile Application

A necessary component of Phase 2 is the development and deployment of an occupancy declaration and verification mobile app to travel toll free. To fulfill this need, Metro is procuring the services of a developer to provide a reliable, fast, and easy-to-use automated vehicle occupancy declaration and verification solution, subject to accuracy requirements, using a method that requires that the driver and/or passengers have at least one smartphone.

Three approaches are provided as illustrative examples only:

1. Have the driver declare the occupancy through the app and have every person in the vehicle use the device's camera to take a picture.
    a. The picture would then be processed on the phone to recognize each person's face and ensure there are no duplicate images from the same person for that trip.
2. Have the front passenger take a single in-app front camera picture that clearly shows how many people are in the vehicle.
    a. Software processing recognizes and counts the number of persons in the photograph.
3. Have the passengers perform a voice call to a designated phone number that would utilize voice signature recognition to verify the number of passengers in the vehicle.

Once the occupancy is successfully verified, the mobile app would send the validated occupancy declaration to the BOS via a secure, authenticated connection to receive toll-free travel for the trip. The BOS would send back an acknowledgement to confirm receipt of the trip information.

9.5 Findings/Recommendations

There has been ongoing coordination between Metro, Caltrans, and FHWA to identify the required sign modifications for the Pilot. If the Pilot is successful and selected for permanent operations, Metro will continue to coordinate with Caltrans and FHWA prior to permanent implementation to discuss if any permanent sign modifications should be considered.

Since Metro has obtained Caltrans' concurrence on the preferred signage, the next step is to update the sign(s) concepts using a sign design software (e.g. GuideSign) to finalize details (e.g. text size and layout) for approval.

With respect to the Pilot, signage placement will follow the latest MUTCD and Caltrans standards for toll lanes and access points. Metro will coordinate with neighboring toll road and express lanes operators to ensure regional consistency in the messaging to customers.

The mobile app will be used as a vehicle occupancy declaration and verification system and could help improve ExpressLanes operations by confirming vehicle occupancies for toll-free travel. While it is not yet clear whether mobile apps can help minimize the impacts of misuse and aid in the reduction of occupancy misrepresentation, vehicle occupancy verification technology can augment enforcement and electronic occupancy detection equipment.

INTENTIONALLY LEFT BLANK

10 Data Collection and Analysis Plan

The Data Collection and Analysis Plan provides guidance for gathering a sufficient data sample for a minimum of one year before and after implementation of each phase of the Pilot. If data is available, at least three years of "before" data for improved model training should be considered. The Plan will assess the impact of each phase of the Pilot as it begins as a Transit Only program and then extends to include HOV5+. Also, there will be an evaluation period at the end of the Pilot where data from both phases are compared to each other to gauge their effectiveness. The plan includes a reasonable level of control variables, high-level procedures for performing the analysis, and additional procedures to evaluate significance of the results by applying relevant statistical tests, if available. The plan also defines the roles and responsibilities between Metro ExpressLanes, its relevant partners, and the before-and-after analysts regarding data collection and analysis.

10.1 Performance Metrics

This primary performance metrics used in the evaluation of the I-10 Pilot were selected based on their alignment with the Pilot's stated objectives from the original April 2018 Board Motion:

- Keep transit moving in the ExpressLanes.
- Move people more efficiently in the ExpressLanes.
- Reduce occupancy misrepresentation by ExpressLanes users.

In collaboration with key stakeholders, FHWA, and Caltrans, the following performance criteria were selected for post-Pilot evaluation:

- Travel time and travel time reliability (EL/GP)
- Maintenance of 45 mph speeds in the ExpressLanes, as well as overall or average speeds
- Transit ridership
- Person throughput (EL/GP)
- Transit running time

These metrics are discussed in greater detail in Table 22, and they are listed in no particular order.

Table 22. Data Collection Procedures for Metrics

METRIC 1: TRAVEL TIME AND TRAVEL TIME RELIABILITY (EL/GP)	
Quantitative Definition	• Calculated travel time difference (in minutes) on the I-10 ExpressLanes between I-605 and Union Station (El Monte Busway and Alameda). • Travel time reliability will be calculated using the 95th percentile travel speed, buffer index (additional time necessary to plan a trip and ensure on-time arrival), and planning time index (total time necessary to plan a trip and ensure on-time arrival). • Travel times and travel time reliability will be calculated for the peak, shoulder, and midday periods.
Control Variables	• Travel time will be evaluated for the I-10 as defined in the Quantitative Definition. • During the Pilot, any external variables/anomalies will be identified, noted, and to the extent possible will remove the influence of confounding variables to reflect "typical" operating conditions.
Data Needs	• FasTrak® transponder data will be the main data source. – This data can be supplemented by detector data to support travel time calculations for the entire corridor.
Timeframe Considerations	• Recommend minimum of one year of "before" and one year of "after" full implementation data for both phases, if available. Include at least three years of "before" data for improved model training.
Data Sources	• FasTrak® transponder data • Caltrans Performance Measurement System (PeMS) • ExpressLanes Traffic Detection System
Data Collection Considerations	• Will require coordination with other operational groups as defined in Data Sources. Performance data should cover 5:00-9:00am for the AM peak period, 9:00-10:00 am for the AM shoulder period, 3:00-4:00pm for the PM shoulder period, and 4:00-7:00pm for the PM peak period. The midday period performance data should cover 10:00am-3:00pm. Data should be collected on non-holiday weekdays.
Analysis Method	• Create a regression model for travel time and travel time reliability for all vehicles on the I-10 ExpressLanes using "before" data as the training set to account for both historical trends on I-10 and other global factors that are not a direct result of the occupancy changes. – The comparison of the "before" and "after" travel times in GP and ELs will take into account appropriate control variables with external influences as they are readily available. Phase 1 "after" data will be for transit only; Phase 2 "after" will be for HOV5+ only. • Measure and document the travel time, buffer index, and planning time index differences between the peak, shoulder, and midday periods defined in Timeframe Considerations. – Report the differences as the impact of the Pilot on travel time reliability. – Evaluate metric monthly by measuring and plotting the differences.

METRIC 2: MAINTENANCE OF 45 MPH IN THE EXPRESSLANES	
Quantitative Definition	• Calculated peak, shoulder, and off-peak travel speeds maintained on the I-10 ExpressLanes between El Monte Station and Union Station. • Will be calculated based on data from the Travel Time and Travel Time Reliability metric for the I-10 ExpressLanes only.
Control Variables	• Same as Control Variables for Travel Time and Travel Time Reliability metric.
Data Needs	• Same as Control Variables for Travel Time and Travel Time Reliability metric.
Timeframe Considerations	• Same as Control Variables for Travel Time and Travel Time Reliability metric.
Data Sources/Initial Point of Contact	• Same as Control Variables for Travel Time and Travel Time Reliability metric.
Data Collection Considerations	• Same as Control Variables for Travel Time and Travel Time Reliability metric.
Analysis Method	• To the extent possible based on the availability of data, the travel times will be calculated following a method that is consistent with the process used for existing evaluation of the achievement of 45 mph performance targets as reported in the ExpressLanes annual performance report.

METRIC 3: TRANSIT RIDERSHIP	
Quantitative Definition	• Total number of passengers carried by transit vehicles across all routes and providers that operate on the I-10 ExpressLanes between El Monte Station and Union Station (El Monte Busway and Alameda). – Metro Transit (Silver Lines [910/950], Line 487) and Foothill Transit (Silver Streak). • Additional consideration should be given for transit ridership that may extend beyond I-10 onto I-110. – Silver Line noted above extends from El Monte Station on I-10 to Union Station (El Monte Busway and Alameda) where it continues on I-110 to the Harbor Gateway Transit Center.
Control Variables[10]	• Agency-wide ridership trends which will be evaluated separately for each transit agency. • During the Pilot, any external variables/anomalies will be identified, noted, and to the extent possible, will remove the influence of confounding variables to reflect "typical" operating conditions.
Data Needs	• Monthly ridership data from Metro Transit and Foothill Transit for routes defined in Quantitative Definition.
Timeframe Considerations	• Recommend a minimum of one year of "before" and one year of "after" full implementation data for both phases, if available. Include at least three years of "before" data for improved model training.
Data Sources/ Initial Point of Contact	• *Foothill Transit Operations Group:* Joseph Raquel, Director of Planning • *Metro Transit Operations Group:* Wayne Wassell, Transportation Planning Manager I-10
Data Collection Considerations	• Account for boardings from El Monte Station to Union Station (El Monte Busway and Alameda I-10 trips) with a focus on the number of passengers departing El Monte Station. Estimates on ridership statistics are on Metro website http://isotp.metro.net/MetroRidership/Index.aspx; accuracy of data should be confirmed prior to using as a source.

[10] Metro will incorporate the following controls into the analysis to mitigate the influence of external variables, such as special events or weather, seasonal effects or academic calendars (such as California State University, Los Angeles). These control variables are consistent for all metrics in the Data Collection Plan.

Analysis Method	• Stratification between transit agencies is not recommended.[11] • Filter data by: – *Time of Day:* Traditional peak periods AM (5:00am- 9:00am), PM (4:00pm-7:00pm), shoulder (9:00-10:00am/ 3:00-4:00pm), as well as total daily ridership. – *Type of Day:* Weekdays (Monday-Thursday) excluding holidays. • Create a regression model for the total number of passengers carried by transit vehicles on I-10 ExpressLanes using “before” data as the training set to account for historical trends on I-10 and other global factors that are not a direct result of the change in occupancy requirements. • Measure the difference between the future predicted transit ridership from the regression model and the actual observed transit ridership during the “after” period defined in Timeframe Considerations. Phase 1 "after" data will be for transit only; Phase 2 "after" will be for HOV5+ only. – At the analyst's discretion and based on the most reasonable data collected, the analysis may forego future forecast modeling and conduct comparative analysis of "like" months (accounting for this cyclical data set). – An assessment will also be made of the averages across all 12 “before” and all 12 “after” months. – Report this difference as the impact of the I-10 HOV5+ Pilot on transit ridership. • Analyze and plot the monthly differences during the Pilot to evaluate whether this metric is increasing or tapering off over time or remaining stable.

[11] Do not stratify the data by agency due to the potential negative correlation between them with respect to I-10 ExpressLanes ridership. Specifically, in consideration of the fact that agencies may acquire riders from each other. For example, if ridership decreases on the Silver Line (e.g., due to service cuts), it may result in ridership increases on the Silver Streak as riders switch to a comparable alternate service.

METRIC 4: PERSON THROUGHPUT (EL/GP)	
Quantitative Definition	• Determines the changes in vehicle occupancies, including transit vehicles during AM and PM peak (5:00-9:00am and 4:00-7:00pm) and shoulder peak (9:00-10:00 am and 3:00-4:00pm) periods between El Monte Station and Union Station (El Monte Busway and Alameda).
Control Variables	• During the Pilot, any external variables/anomalies will be identified, noted, and to the extent possible will remove the influence of confounding variables to reflect "typical" operating conditions.
Data Needs	• Data for all passenger vehicles traveling in the peak direction on the I-10 ExpressLanes will be collected via manual observations.
Timeframe Considerations	• Include up to two days of "after" data collection each calendar month for both phases. – Data will not be collected for consecutive days and will target Tuesdays, Wednesdays, and Thursdays. Specific dates for data collection will be determined by Metro. • Specific times include 5:00-9:00am for the westbound AM peak period, 9:00-10:00am for the westbound AM shoulder period, 3:00-4:00pm for the eastbound PM shoulder period, and 4:00-7:00pm for the eastbound PM peak period February through October. Low light level in November through January (dark months) makes it difficult to conduct observations. As a result, the AM peak data collection hours would be 6:00-10:00am. **Data collection methodology considers a 2-week adjustment to the time change.* • Include at least three years of "before" data for improved model training, if available. Include at least three years of "before" data for improved model training, if available.
Data Sources	• Metro, or their contractor, will manually collect data for non-holiday weekdays during the AM and PM peak and shoulder periods.
Data Collection Considerations	• Limited data are available for occupancy and person throughput. • Metro to coordinate with Caltrans on data collection methodology and field collection locations (Jackson Avenue and Warwick Road). – Data should cover the AM and PM peak and shoulder periods for non-holiday weekdays.
Analysis Method	• Analysis will measure and document the difference between the "before" and "after" person throughput for the periods defined in Timeframe Considerations. Phase 1 "after" data will be for transit only; Phase 2 "after" will be for HOV5+ only. – Report this difference as the impact of the I-10 HOV5+ Pilot on person throughput. – Measure and plot the differences to evaluate whether this metric is increasing or tapering off over time or remaining stable.

METRIC 5: TRANSIT RUNNING TIME	
Quantitative Definition	• Transit running time is the actual travel time of transit vehicles on the I-10 ExpressLanes between El Monte Station and Union Station (El Monte Busway and Alameda). – Metro Transit (Silver Lines [910/950], Line 487) and Foothill Transit (Silver Streak)
Control Variables	• Agency transit running time will be evaluated separately for each route defined in the Quantitative Definition. • During the Pilot, any external variables/anomalies will be identified, noted, and to the extent possible, remove the influence of confounding variables to reflect "typical" operating conditions.
Data Needs	• Monthly travel time data from Metro Transit and Foothill Transit for routes defined in Quantitative Definition.
Timeframe Considerations	• Recommended minimum of one year of "before" and one year of "after" full implementation data for both phases. If available, include at least three years of "before" data for improved model training.
Data Sources/ Initial Point of Contact	• *Foothill Transit Operations Group:* Joseph Raquel, Director of Planning • *Metro Transit Operations Group:* Wayne Wassell, Transportation Planning Manager I-10
Data Collection Considerations	• Will require coordination with other operational groups as defined in Data Sources. • These data are not available in existing publicly available archive databases. • Peak and shoulder period performance data should cover 5:00-9:00am for the AM peak period, 9:00-10:00 am for the AM shoulder period, 3:00-4:00pm for the PM shoulder period, and 4:00-7:00pm for the PM peak period for non-holiday weekdays.
Analysis Method	• Measure and document the difference between the scheduled and actual arrival times during the "after" period combined across all vehicles (or all sampled vehicles) for a vehicle-hours of lateness total during the period defined in Timeframe Considerations. Phase 1 "after" data will be for transit only; Phase 2 "after" will be for HOV5+ only. – At the analyst's discretion and based on the most reasonable data collected, the analysis may forego future forecast modeling and conduct comparative analysis of like months (accounting for this cyclical data set). – An assessment will be made for the averages across all 12 "before" months and all 12 "after" months. – Report this difference in written form and graphically (e.g. scatter plot) as the Pilot's impact to on-time performance. – Measure and plot the differences by month to evaluate if this metric is increasing or decreasing over time or remaining stable.

10.2 Findings/Recommendations

Metro will continue to coordinate with Caltrans and FHWA to ensure the Data Collection and Analysis Plan is sufficient to measure the impacts of the Pilot overall and at the end of each phase. Additionally, Metro will coordinate with the partner agencies identified in the Data Collection and Analysis Plan prior to implementation to ensure appropriate and consistent data can be available for the before and after assessments of each phase. Ultimately, the results from this effort should feed back into any public engagement, as well as inform decision-makers regarding applicability of a transit only and/or HOV5+ program for their corridors.

11 Cost Considerations

11.1 Methodology

The cost estimates shown in Figure 20 were developed in close coordination with the Metro Congestion Reduction, Community Relations, Marketing, and Vanpool departments; Caltrans (signage); and through marketing research conducted as part of consultant services for each of the required elements outlined in the PIP. The estimates are summarized in the following sections which include the outreach/education and marketing campaign; mitigation and incentivization strategies; operational elements; before/after data collection; and post-Pilot evaluation activities.

Figure 20. Cost Estimate Summary

TASK	COST
Outreach/Education/Marketing	$1,895,960
Mitigations/Incentives	$2,450,910
Operational Elements (i.e. design, signage changes, CSC/BOS, mobile app)	$2,109,575
Before/After Data Collection and Management	$1,452,300
TOTAL	**$7,908,745**

11.2 Outreach, Education, and Marketing

The outreach, education, and marketing costs outlined below encompass the activities necessary to successfully inform the public about the ExpressLanes policy change. Metro's research indicated that changing existing HOV policies is a challenging task when stricter policies are proposed. An extensive public outreach and education campaign that thoroughly educates the public on the new requirements will be essential to the successful transition to transit only and then HOV5+, especially since I-10 and I-110 have different business rules.

Various outreach, education, and marketing strategies were developed for each phase to give Metro the flexibility to implement strategies at appropriate times (e.g. pre-Pilot, Pilot, and post-Pilot periods). These strategies include direct mail to existing customers, social media, paid media, and other creative outreach methods to reach the diverse audiences within the corridor and the greater Los Angeles County. The total cost for each strategy shows a range, which includes a 30% contingency since costs may vary (e.g., time of year or target audience). Costs could be more or less than the estimates provided, and they will be adjusted to achieve the appropriate level of outreach needed at different points throughout the campaign.

11.3 Mitigation/Incentivization Strategies

To mitigate the perceived challenges associated with vanpool and HOV5+ vehicle pool formation, Metro developed mitigation measures to lessen the impacts to existing users and incentivization measures to encourage transit use and/or the formation of vanpools and 5+ vehicle pools. Additionally, toll revenues from the I-10 ExpressLanes are currently being reinvested in mobility improvements in the surrounding communities, and they are providing improvements to the regional transportation network. Metro will be further developing a Transit Re-Investment Program whereby funds could be allocated to support transit operations within the corridor, including current operators such as Metro and Foothill Transit. By reinvesting toll revenue into transit, it could encourage transit use throughout the corridor by providing subsidies for transit service and/or operational improvements.

11.4 Operational Elements

Metro has been coordinating with Caltrans and FHWA regarding operational elements and required signage changes and data needs that will be required prior to Go Live. Also, preparations are underway for the mobile app procurement to address potential customer service technology needs. Metro will also pursue opportunities to minimize costs and meet the expedited timeline by using the existing Caltrans Maintenance Agreement to replace signs when possible.

11.5 Before and After Data Analysis

The costs provided below show the estimated range needed for the before and after data collection and for data analysis to understand the Pilot's impacts. Some of the assumptions used for the performance metrics include:

- Transit Ridership, Transit Running Time, and Travel Time and Travel Time Reliability: 12 months of data will be collected every other month.
    - Metro will coordinate with transit agencies to collect their data.
- *Person Throughput:* AM peak (5:00-9:00), PM peak (3:00-7:00), plus a half hour before and after each shift would be analyzed.
    - Only collect data in the peak period direction for two ExpressLanes and four GP lanes.
    - Personnel/equipment required is one spotter and one recorder.
- *Travel Time and Travel Time Reliability:* Data will be collected through FasTrak®, PeMS, and ExpressLanes detection system.
- *Maintenance of 45 mph Speeds:* Data collected for travel time and travel time reliability will be analyzed.

12 Conclusion

Metro's efforts to find innovative solutions to address congestion on the I-10 ExpressLanes has led to its consideration of a phased Pilot to test the effectiveness of more restrictive occupancy policies. Given that the traveling public is accustomed to the current HOV2+/3+ requirement for toll-free travel on the facility, the change to transit only (Phase 1) and then HOV5+ (Phase 2) will require comprehensive and well-executed approaches to operational implementation and stakeholder, public, and customer relations.

Key contributors to a successful Pilot include the need for:

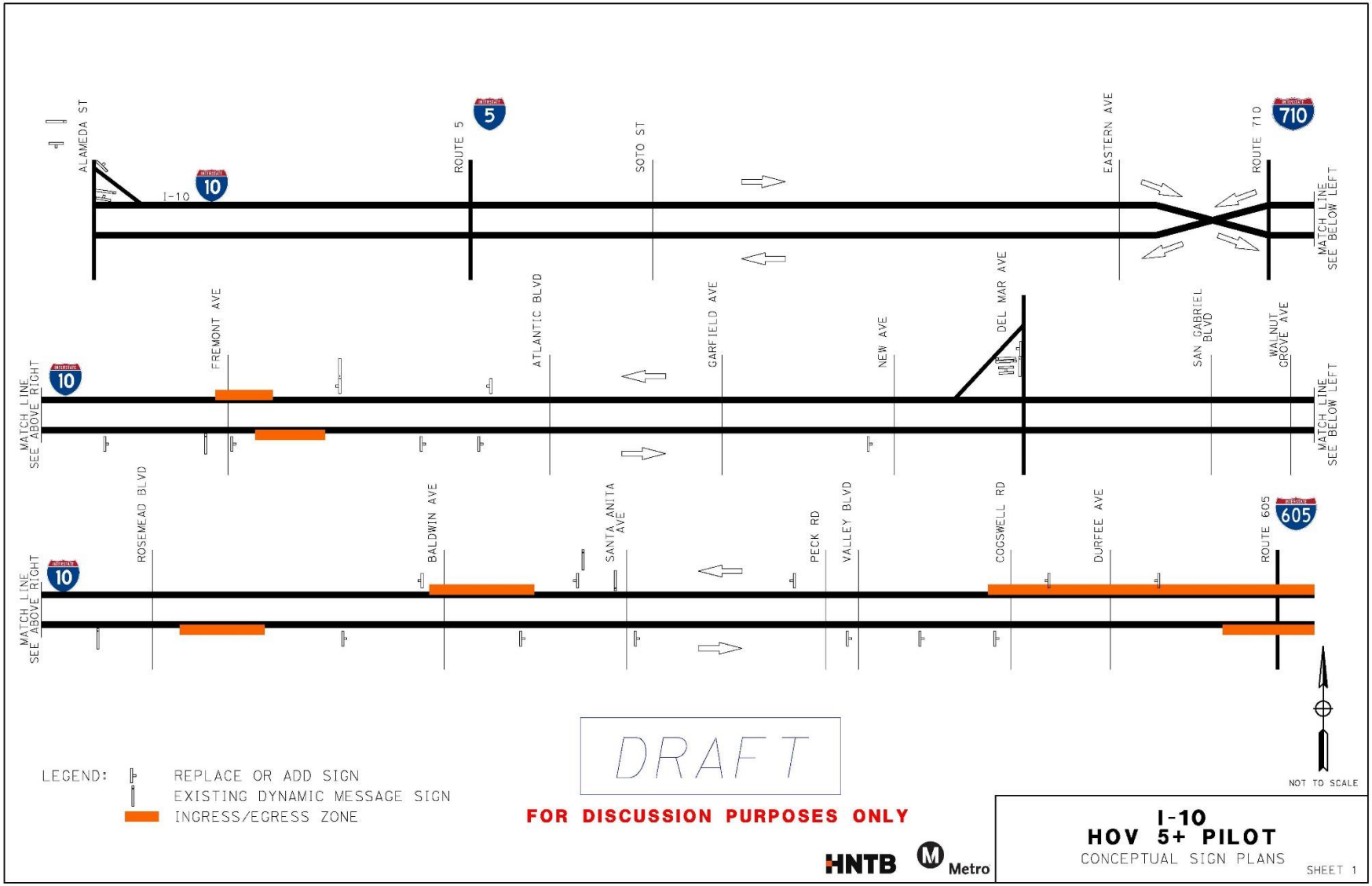
- A robust outreach and communications program to educate customers, stakeholders, and the public regarding the need for the policy change and the benefits expected from each phase of the Pilot.
- Close coordination and teamwork with transit partners, CHP, Caltrans, and FHWA to ensure the Pilot considers their perspectives and needs.
- A comprehensive plan and well-executed implementation of the technology and operational aspects of the Pilot.
- Transparency and accountability when executing and evaluating the Pilot.
- Flexibility and agility to respond to unforeseen circumstances and/or results during the Pilot.

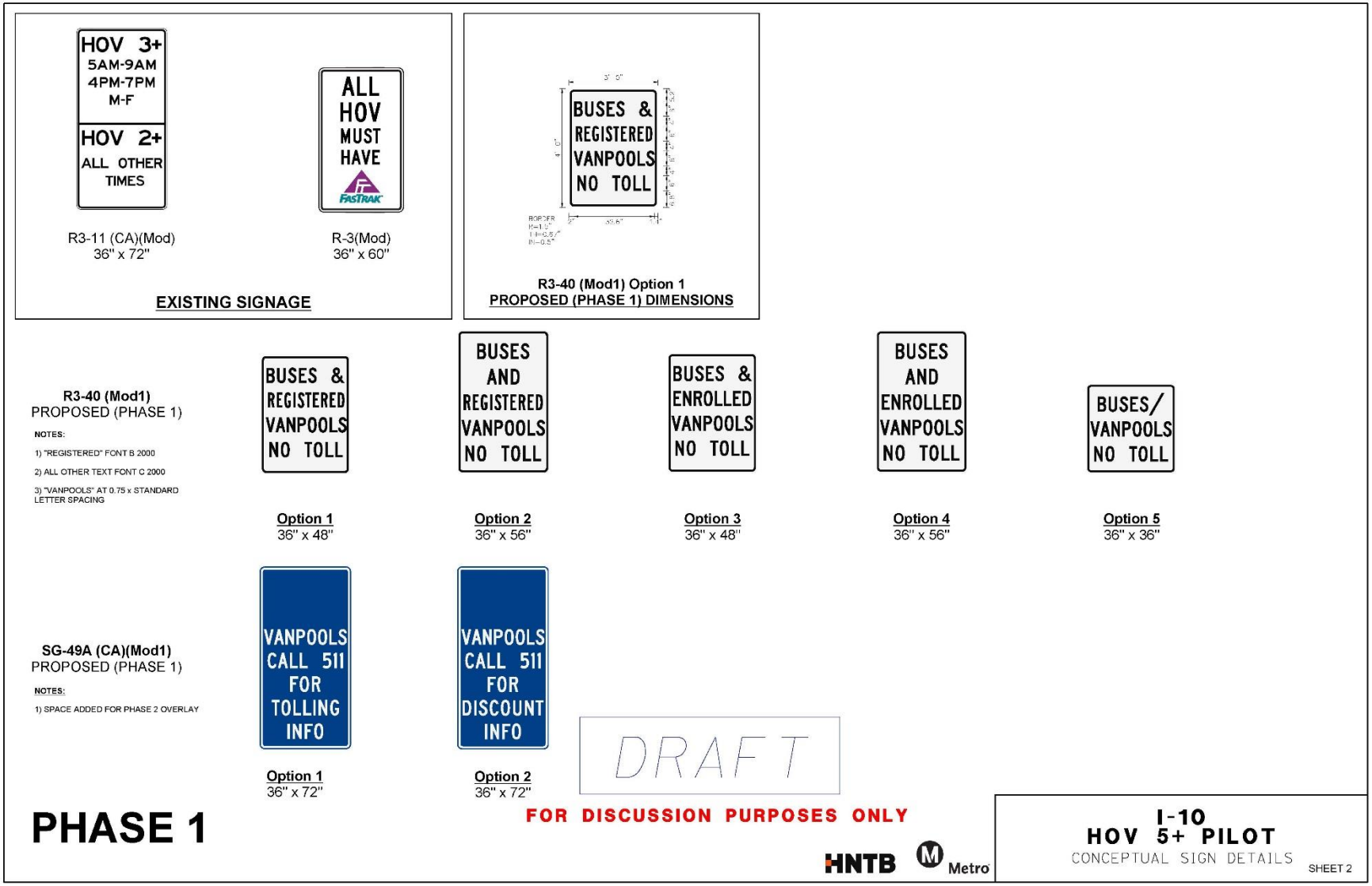
Metro is breaking new ground in considering this Pilot. Based on research and a thorough consideration of options and alternatives, Metro developed a PIP with a phased approach to support a Pilot that changes the occupancy requirements for toll-free travel on the I-10 ExpressLanes. The PIP incorporates a comprehensive approach to informing the commuting public regarding the goals, objectives, and operating changes associated with the Pilot's phases, as well as a detailed implementation roadmap, master schedule, and recommended budget to support each phase.

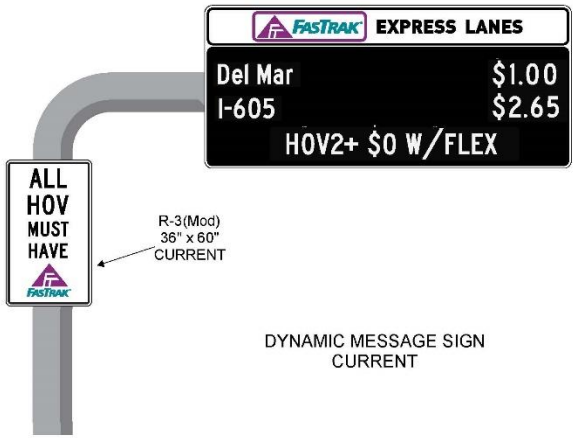
Upon Board approval, Metro staff is prepared to move forward with Phase 1 in accordance with the PIP. Metro staff recommends a 14-month Pilot operational period (including a 2-month introductory grace period). This PIP has examined options and made recommendations which, if implemented, will increase the likelihood of a successful Pilot.

APPENDICES

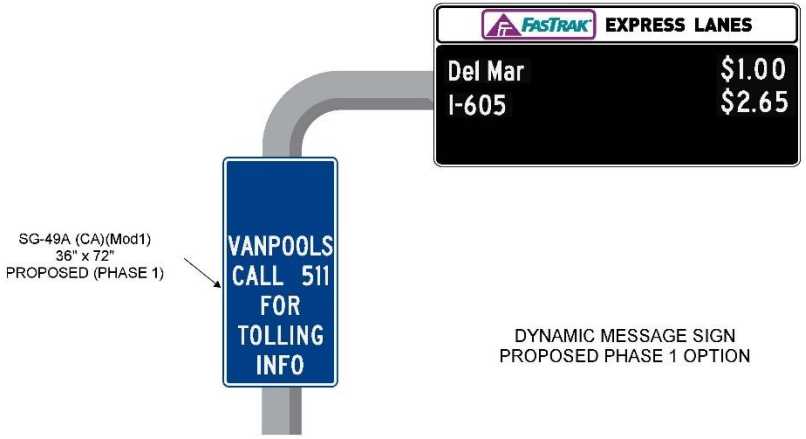
Appendix A. Proposed Signage Plan


ALAMEDA ST
I-10
ROUTE 5
SOTO ST
EASTERN AVE
ROUTE 710
MATCH LINE SEE BELOW LEFT
MATCH LINE SEE ABOVE RIGHT
FREMONT AVE
ATLANTIC BLVD
GARFIELD AVE
NEW AVE
DEL MAR AVE
SAN GABRIEL BLVD
WALNUT GROVE AVE
ROSEMEAD BLVD
BALDWIN AVE
SANTA ANITA AVE
PECK RD
VALLEY BLVD
COGSWELL RD
DURFEE AVE
ROUTE 605
LEGEND:
REPLACE OR ADD SIGN
EXISTING DYNAMIC MESSAGE SIGN
INGRESS/EGRESS ZONE
DRAFT
FOR DISCUSSION PURPOSES ONLY
NOT TO SCALE
HNTB
Metro
I-10
HOV 5+ PILOT
CONCEPTUAL SIGN PLANS
SHEET 1
12/05/2019


HOV 3+
5AM-9AM
4PM-7PM
M-F
HOV 2+
ALL OTHER TIMES
R3-11 (CA)(Mod)
36" x 72"
ALL HOV MUST HAVE
FASTRAK
R-3(Mod)
36" x 60"
EXISTING SIGNAGE
BUSES & REGISTERED VANPOOLS NO TOLL
R3-40 (Mod1) Option 1
PROPOSED (PHASE 1) DIMENSIONS
R3-40 (Mod1)
PROPOSED (PHASE 1)
NOTES:
1) "REGISTERED" FONT B 2000
2) ALL OTHER TEXT FONT C 2000
3) "VANPOOLS" AT 0.75 x STANDARD LETTER SPACING
BUSES & REGISTERED VANPOOLS NO TOLL
Option 1
36" x 48"
BUSES AND REGISTERED VANPOOLS NO TOLL
Option 2
36" x 56"
BUSES & ENROLLED VANPOOLS NO TOLL
Option 3
36" x 48"
BUSES AND ENROLLED VANPOOLS NO TOLL
Option 4
36" x 56"
BUSES/ VANPOOLS NO TOLL
Option 5
36" x 36"
SG-49A (CA)(Mod1)
PROPOSED (PHASE 1)
NOTES:
1) SPACE ADDED FOR PHASE 2 OVERLAY
VANPOOLS CALL 511 FOR TOLLING INFO
Option 1
36" x 72"
VANPOOLS CALL 511 FOR DISCOUNT INFO
Option 2
36" x 72"
DRAFT
FOR DISCUSSION PURPOSES ONLY
PHASE 1
12/05/2019
HNTB
Metro
I-10
HOV 5+ PILOT
CONCEPTUAL SIGN DETAILS
SHEET 2



DYNAMIC MESSAGE SIGN
CURRENT



DYNAMIC MESSAGE SIGN
PROPOSED PHASE 1 OPTION

DRAFT

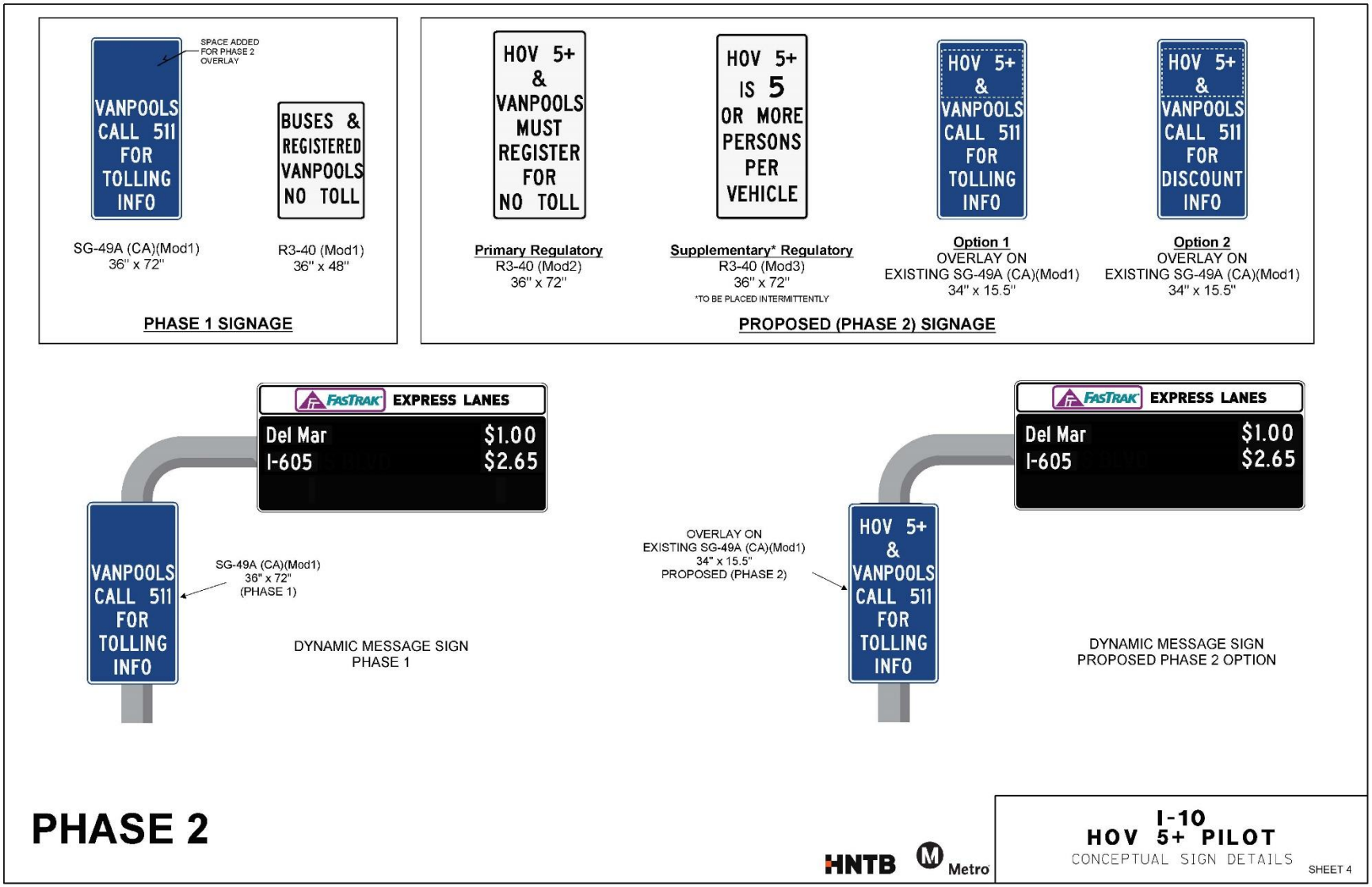
FOR DISCUSSION PURPOSES ONLY

12/05/2019

PHASE 1

HNTB Metro

I-10
HOV 5+ PILOT
CONCEPTUAL SIGN DETAILS
SHEET 3


SPACE ADDED FOR PHASE 2 OVERLAY
VANPOOLS CALL 511 FOR TOLLING INFO
SG-49A (CA)(Mod1)
36" x 72"
BUSES & REGISTERED VANPOOLS NO TOLL
R3-40 (Mod1)
36" x 48"
PHASE 1 SIGNAGE
HOV 5+ & VANPOOLS MUST REGISTER FOR NO TOLL
Primary Regulatory
R3-40 (Mod2)
36" x 72"
HOV 5+ IS 5 OR MORE PERSONS PER VEHICLE
Supplementary* Regulatory
R3-40 (Mod3)
36" x 72"
*TO BE PLACED INTERMITTENTLY
HOV 5+ & VANPOOLS CALL 511 FOR TOLLING INFO
Option 1
OVERLAY ON
EXISTING SG-49A (CA)(Mod1)
34" x 15.5"
HOV 5+ & VANPOOLS CALL 511 FOR DISCOUNT INFO
Option 2
OVERLAY ON
EXISTING SG-49A (CA)(Mod1)
34" x 15.5"
PROPOSED (PHASE 2) SIGNAGE
FASTRAK EXPRESS LANES
Del Mar $1.00
I-605 $2.65
VANPOOLS CALL 511 FOR TOLLING INFO
SG-49A (CA)(Mod1)
36" x 72"
(PHASE 1)
DYNAMIC MESSAGE SIGN
PHASE 1
OVERLAY ON
EXISTING SG-49A (CA)(Mod1)
34" x 15.5"
PROPOSED (PHASE 2)
HOV 5+ & VANPOOLS CALL 511 FOR TOLLING INFO
DYNAMIC MESSAGE SIGN
PROPOSED PHASE 2 OPTION
PHASE 2
12/05/2019
HNTB
Metro
I-10
HOV 5+ PILOT
CONCEPTUAL SIGN DETAILS
SHEET 4

Appendix B. Implementation Roadmap and Master Schedule

There are numerous activities Metro must initiate and/or complete to successfully gain approval for and implement the Pilot. The Draft PIP Implementation Roadmap and Master Schedule identifies the high-level activities Metro will need to complete to prepare for and implement the Pilot.

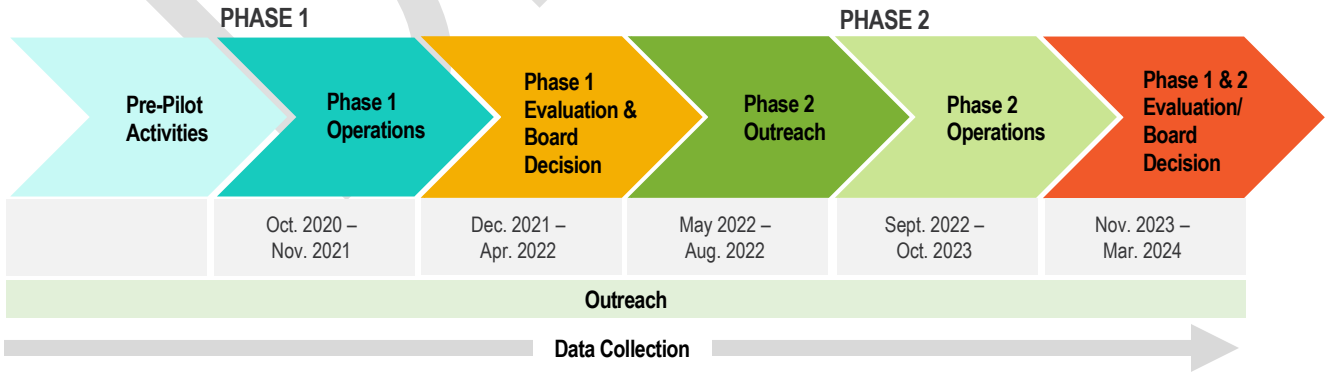
As opposed to a more detailed Gantt chart or other scheduling tool, the PIP Implementation Roadmap and Master Schedule is a high-level management tool. Its purpose is to capture all key activities, and make sure tasks are scheduled in a logical order. For example, under Development of Pre- and Post-Change Data Needs and Collection Plan, there is a task entitled, Collect and Report Performance Data. The Roadmap and Schedule shows this as an ongoing activity throughout the Pilot. It is assumed that a detailed schedule for gathering and reporting data will be developed and managed by the task owner. In the same manner, as needed, other task owners may develop more granular schedules to support implementation.

The Roadmap and Master Schedule are arranged by category according to the tasks associated with the PIP's scope of work. Three additional categories have been included. The first one, Program/Project Management indicates what project management activities and decisions will need to be made; some of these may be finalized already. When this is the case, those activities can be "checked off" as completed. All key activities and decisions were considered during the PIP development process. The other two categories are Technology/Systems Readiness and Operations Support Readiness. The activities associated with these categories ensure any PIP/Pilot decisions that impact the toll collection and/or back-office technology or operations support, such as CSR training, are considered.

The Roadmap and Master Schedule identifies activities and decisions that are broken into 11 categories and six timeframes. The Activity column indicates what needs to be accomplished. These are included at an executive overview level and not meant to identify each sub-activity or step associated with the activity identified. The remaining columns represent the phase(s) when activities should occur.

Timeline of Pilot Activities

The below graphic shows the Pilot timeline. The Roadmap and Master Schedule is intended to be a living document and should be revised as new information becomes available.



Implementation Roadmap/Master Schedule

Program/Project Management

ACTIVITY	Pre-Pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Determine who from the Congestion Reduction Team will own/manage the project, schedule, risk register, etc.						
2. Determine internal Metro Pilot team organization structure, including matrix relationships, decision-making authority, etc.						
3. Develop unified success statement for the Pilot with SMART goals/KPIs (to be included in the Board report).						
4. Conduct “Black Cloud” work session. Review risk register to make sure all risks are captured. Identify top risks and assign “owners” to each risk.						
5. Finalize Pilot budget & schedule.						
6. Develop & implement project tracking/reporting process.						

ACTIVITY	Pre-Pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
7. Update & maintain project budget, schedule, risk register, open issues log, and implement regular updates.						
8. Implement regular project team meetings.						
9. Develop draft continuance or roll-back/decommission plan for each phase.						
10. Implement Phase 1 operations & evaluation. Present results to Board.						
11. Implement Phase 2 operations & evaluation. Present to Board to determine Pilot's future.						

Identification and Coordination with Partner Transit Agencies and Key Stakeholders

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Meet to review PIP & identify any concerns and action items; add items to Open Issues Log; establish issue resolution process.						
2. Establish regular (bi-weekly or monthly) check-in meetings to keep them abreast of PIP & Pilot activities.						

Metro

Public Education and Marketing Campaign Recommendations

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Meet with Metro Communications team. Finalize Outreach & Marketing campaign plan, budgets, and effectiveness evaluation process.						
2. Identify & procure necessary vendors, including an Outreach Coordinator (e.g. Metro Marketing/Communications and support vendors).						
3. Prepare Phase 1 programs and materials.						
4. Conduct Phase 1 outreach/ marketing plan activities.						
5. Evaluate & report on Phase 1 outreach/ marketing plan effectiveness.						
6. Prepare Phase 2 programs & materials.						
7. Conduct Phase 2 outreach/marketing plan activities.						
8. Evaluate & report on Phase 2 outreach/ marketing plan effectiveness.						

Mitigation Strategies

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Work with internal Metro stakeholders; support to flesh out details of outreach & mitigation/incentivization strategies.						
2. Finalize & get outreach & mitigation/incentivization strategies approved, including budget.						
3. Prepare Phase 1 outreach, mitigation/incentivization strategies, programs, and materials.						
4. Conduct Phase 1 outreach, mitigation/incentivization activities.						
5. Evaluate & report on Phase 1 mitigation/incentivization strategies effectiveness. Identify Phase 2 modifications.						
6. Prepare Phase 2 outreach, mitigation/incentivization strategies, programs, and materials.						
7. Conduct Phase 2 outreach & mitigation/incentivization activities.						
8. Evaluate & report on Phase 2 mitigation/incentivization strategies effectiveness.						

Metro

Identification of Required Signage Changes

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Coordinate with Pay As You Go Pilot program.						
2. Coordinate with 511 Program for signage updates.						
3. Obtain Caltrans/FHWA approval of signage plans.						
4. Final design, procurement, & fabrication of Phase 1 signage.						
5. Install Phase 1 signage.						
6. Maintain Phase 1 signage.						
7. Procurement & fabrication of Phase 2 signage.						
8. Install Phase 2 signage.						
9. Maintain Phase 2 signage.						

Development of Pre- and Post-change Data Needs and Collection Plan

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Approve Pre- & Post-Data Collection Plan including reporting format.						
2. Collect pre-pilot data. Populate & test reporting dashboard.						
3. Collect & report on performance data.						

Detailed Cost Estimate

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Gain approval of Pilot budget (revenue and expense); incorporate into annual budgets; integrate into Metro budget monitoring and reporting format(s).						
2. Monitor & report.						

HOV Degradation Mitigation Plan Support

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Coordinate with FHWA & Caltrans to adapt the PIP into a suitable format for Caltrans' HOV Degradation Mitigation Plan.						

Board Presentation Support

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Obtain Pilot approval.						
2. Develop draft Committee/ Board report (Phases 1 and 2).						

Technology/Systems Readiness

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Procure & implement mobile app.						
2. Assess any impacts from PIP/Pilot decisions on toll technology (lane, BOS/CSC, etc.).						
3. Develop technical needs, work plan, & schedule.						
4. Implement technology/ system changes to support Phase 1.						
5. Develop/implement technology/system changes to support Phase 2.						

Metro

Operations Support Readiness

ACTIVITY	Pre-pilot Activities	Phase 1 Operations	Phase 1 Evaluation & Board Decision	Phase 2 Outreach	Phase 2 Operations	Phase 1 & 2 Evaluation/ Board Decision
1. Assess impacts of Phase 1 PIP decisions on CSC & other operations.						
2. Develop operations/CSC staff training plan & other Phase 1 readiness activities and materials.						
3. Implement Phase 1 CSR training & other operations readiness activities.						
4. Assess impacts of Phase 2 decisions on CSC & other operations.						
5. Develop operations/CSC staff training plan & other Phase 2 readiness activities and materials.						
6. Implement Phase 2 CSR training & other operations readiness activities.						

Appendix C. Risk Register

As part of the PIP, Metro has identified high-level risks that could negatively impact the success of the Pilot. Potential risks range from delay in gaining approval for a Pilot; delay in obtaining services and/or technology; public resistance to the Pilot; and negative impacts on GP lane congestion, particularly in Phase 1. These have been captured in a draft Risk Register, which identifies the risk scenario, the potential for the scenario occurring, the consequences if the scenario occurs, and the potential mitigation strategies. The Risk Register also assigns monitoring and management of the risk to an individual and includes a color-coded status indicator.

Metro will designate an "owner" of the Risk Register who will be responsible for its initial establishment and maintenance. It should be updated on a regular basis during the Pilot implementation and operational phases.

RISK REGISTER

ID	SCENARIO	LIKELIHOOD	IMPACT	IMPACT DESCRIPTION	MITIGATION	ASSIGNED TO	SCHEDULE STATUS
1	Delay in obtaining timely concurrence/ approvals from Caltrans and FHWA	**Moderate**	**Moderate to High**	Delay in obtaining concurrence from Caltrans and FHWA could delay or jeopardize timely implementation of the Pilot.	During pre-PIP approval and PIP implementation, schedule bi-weekly coordination meetings with Metro, FHWA, and Caltrans team leaders to ensure communication and required data needs are met for final concurrence and implementation.	Metro PM	
2	Delay in obtaining services and/or materials through procurement and/or software development challenges	**Moderate**	**Moderate to High**	Delay in obtaining services and/or materials could impede or jeopardize Pilot implementation, particularly Phase 2; it cannot begin without the mobile app and/or other necessary technology/ systems changes in place.	Develop an expedited and detailed procurement plan that is realistic regarding development and deployment timetable) as well as flexible and adaptable with respect to the scope of services.	Metro PM	
3	Public resistance to the Pilot	**Moderate to High**	**Moderate to High**	Public resistance may cause delays to Pilot implementation.	Prepare a comprehensive outreach and education plan that highlights the benefits of the Pilot and describes mitigation measures.	Metro PM	
4	Negative impacts to corridor throughput and GP lane congestion	**High**	**Moderate to High**	Allowing only transit, registered vanpools, and HOV5+ to travel toll free runs the risk that carpools that currently travel toll free will stop using the ELs and add traffic to the GP lanes creating additional congestion and the potential for "empty lane syndrome" in the Els; could lead to questioning the Pilot's effectiveness.	Keep existing 2+/3+ carpool loyalty programs in place. Monitor traffic and be ready to pivot/modify the toll free HOV definition if public concern results in Board reaction.	Metro PM	

LEGENDS

Likelihood

Low: Unlikely to occur.
Moderate: Could occur if not addressed.
High: Almost certainly will occur.

Impact

Low: Will not impact Pilot schedule and/or success.
Moderate: Could delay Pilot schedule and/or success.
High: Almost certainly will impact Pilot schedule and/or success.

Current Status

On target. No current concerns.
Behind target. Can be mitigated and still meet schedule.
Behind target. Negatively impacting schedule. Cannot be mitigated.

Appendix D. Mitigation and Incentivization Strategy Methodology

Mitigation and Incentivization Strategy Scoring

Metro developed a series of questions to evaluate and rank the identified strategies, as shown below. Qualitative criteria were established to evaluate the strategies for the HOV5+ PIP. For each criterion, an ordinal rating system was developed and used to score a strategy between 0 and 100 based on its performance for that specific criterion. The Mitigation Strategy Points table provides the descriptors and the range of input values used to score the eight questions for each of the strategies, and it shows how the scoring levels are identified in the spreadsheet tool.

Mitigation Strategy Points

FACTORS CONSIDERED	VALUES (ANSWERS)	POINTS
1 **Acknowledgement of whether a strategy is similar to those identified in the survey. No points or Pass/Fail was attributed to this question.**	Yes	N/A
	No	N/A
2 **Acknowledgment of whether a strategy either complements or is already being used. No points or Pass/Fail was attributed to this question.**	Yes, this is similar.	N/A
	No, this is not being used.	N/A
3 **Strategies that align with the delivery timeframe of this Pilot receive a Pass; if not, they receive a Fail.**	Yes/Pass	N/A
	No/Fail	N/A
4 **Strategies that align with the Pilot Project's goals will receive higher points. Support increased carpooling/person throughput, increased transit usage, decreased driving trips/vehicle miles traveled.**	Strong direct correlation to the Pilot's goals (shown as High).	100.00
	Some direct correlation to the Pilot's goals (shown as Moderate).	66.67
	Indirect correlation to the Pilot's goals (shown as Low).	33.33
	Can't be tied to the Pilot's goals (shown as N/A).	0.00
5 **Strategies that are lower in cost to implement will receive higher points.**	Lower cost to implement - less than $75K for Pilot (shown as $).	100.00
	Medium cost to implement - $75-150K for Pilot (shown as $$).	66.67
	High cost to implement - $150K+ for Pilot (shown as $$$).	33.33

FACTORS CONSIDERED	VALUES (ANSWERS)	POINTS
6 **Strategies that can be implemented internally are expected to deploy faster than those that would require external coordination/ collaboration, therefore they received higher points.**	Can be implemented internally in Metro's Congestion Group (shown as Easy).	100.00
	Can be implemented within Metro with other groups (shown as Moderate).	66.67
	Reliance on external agencies/ providers (shown as Difficult).	33.33
7 **Strategies that will require higher levels of decision making will receive lower points, particularly where conflicting priorities would delay Pilot implementation.**	CEO only. No Board action would be required (shown as N/A).	100.00
	Board action would be needed (shown as Moderate).	66.67
	Legislative or outside agency action would likely be required (shown as High).	33.33
8 **Strategies that will provide higher levels of service to or potentially generate higher levels of support from a greater public audience will receive higher points.**	Anticipated high level of public acceptance and/or reach; large return on investment expected (shown as High).	100.00
	Anticipated moderate-level of public acceptance and/or reach; moderate return on investment expected (shown as Moderate).	66.67
	Anticipated low amount of public acceptance and/or reach; low return on investment expected (shown as Low).	33.33

Mitigation Strategy Weighting

Once the scores were established, the next step was to weigh the evaluation questions according to their importance to Metro. Since some questions may be more important and deserve a higher weighting than others, the tool was developed with flexibility in mind, so weighting factors can be updated for an evaluation question subset.

The first three questions detailed below served as informational and were not used in the ranking for an overall score.

- Is this identified in the marketing survey report?[12]
- Is this similar to an existing strategy or program used by Metro?
- Can this strategy be implemented in a 6-month time frame? (Pass/Fail)

[12] This was developed from the outcomes of the focus groups and surveys.

The last five questions were used to score the mitigation strategies. Each question includes its percentage value in the overall weighting (total equals 100%):

- Can this strategy be tied to the Pilot's goals? (20%)
- What is the level of cost to implement? (10%)
- How easy would this be to implement? (20%)
- What kind of External, Board, or Executive action would be needed to implement? (25%)
- What is the anticipated reach/acceptance with the community/ participants? (25%)

Top-ranked Mitigation Strategies and Weighted Scores

MITIGATION STRATEGIES	WEIGHTED SCORE
Expand existing 2+/3+ Carpool Loyalty Toll Credit Drawing Program.	91.67
Provide a 2-month introductory period for 2+ and 3+ carpools (depending on peak period) where they can travel for free as they attempt to grow the number of occupants to 5 or more.	86.67
Expand existing Transit Reward Program	85.00

Top-ranked Incentivization Strategies and Weighted Scores

INCENTIVIZATION STRATEGIES	WEIGHTED SCORE
Develop a HOV5+ Vehicle Pool Loyalty Toll Credit Drawing Program.	91.67
Create a free or discounted Guaranteed Ride Home Service (taxis, Metro transit, transportation network company, etc).	86.67
Establish a Vehicle Pool Rewards program similar to the Transit Rewards Program where HOV5+ would receive $15 toll credit after 16 one-way trips during peak period (driver incentive).	85.00

Appendix E. Caltrans 2016 California High Occupancy Vehicle Lane Degradation Determination Report

Appendix F. Caltrans 2017 California High-Occupancy Vehicle Facilities Degradation Report and Action Plan

Appendix G. Caltrans 2018 Managed Lanes Annual Report